ECDIS 24

OPERATOR MANUAL

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MAIN MENU (chapter 3)
- select and configure a printer
- print the image
- screenshot
- ends the ECDIS session

CHARTS MENU (chapter 4)
- select and view the different charts you have available for the world or the currently displayed region
- init the digitizer functions, route planning and drawing objects (option)
- license administration
- installation (CM933, IHO S63, ARCS)
- updates (CM933, S57, ARCS)
- take over the "Chart Server Rights" (option)

OPTIONS MENU ARCS (chapter 5.1)
- actual chart information (Chart Name, Paper Chart Issued.)
- shows the Chart Legend
- shows special Marine or Warning messages
- shows the Update History
- shows updated chart zones highlighted by red lines (square)

OPTIONS MENU S57 (chapter 5.2)
- select Presentation Libraries for S57
- add or delete chart symbols, points, line and text
- add or delete chart data to or from a chart according to S57, Collars and Symbols
- shows the Chart Legend
- shows the Update History
- select different display modes (Basic, Standard, Full, User-Display)
- set the CM933 chart scale mechanism (automatic size, defined size)
- change symbol type from simplified to traditional symbols
- presentation of time dependent or periodic chart objects

DISPLAY MENU (chapter 6)
- Zoom In or Zoom out
- changes the scale of the display (default, largest, specified and center)
- saves, opens and deletes area views pre-defined by the user
- keeping your ship in the display area (ship center)
- own ship symbol will be displayed on scale as silhouette
- changes display colors
- toolbar On or Off
- Status Bar On or Off Information Panel On or Off and panel selection e.g. NAV or TRACK

SHIP MENU (chapter 7)
- specifies the ship's dimensions and navigation device antennas
- showing and selecting a position sensor
- corrects the ship's position based on an ARPA target with a known position
- turn On or Off course vector, heading vector or anti-grounding searchlight
- place a ship mark with a time level at the ship's position
- monitor the drift while anchored
- place an alarm zone around own ship to monitor intruding ARPA targets at defined distance
- turn off the autopilot, places a mark at ship's location MODS
- clear the man overboard alarm and posts an "All Clear" entry to Event Log

NAV TOOLS (chapter 9)
- for drawing an electronic bearing line and variable range marker
- show EBL/VRM Labels
- for thumb line, great circle line calculation
- for calculating position values for different datums
- for calculating the cursor position for different datums
- set/delete position fix marker
- to determine ship's location in Dead Reckoning mode
- to calculate the tidal predictions
- to actuate the magnet variation

PLOT LAYER COMMAND (chapter 10)
- drawing tool
- merges two or more object groups
- Export/Import object groups

LOGS MENU (chapter 11)
- shows log of previous 24 hours
- shows log current 24 hours
- shows the waypoint list of the route
- clears the open route from the display
- toggles primary and secondary route
- clears the ship's position based on an ARPA target
- shows the EBL/VRM labels
- shows the Update History
- shows the Chart Legend
- shows the Update History
- shows the software version and the copyright information

INTEGRATION MENU (chapter 12)
- showing and selecting a position sensor
- AIS / ARPA options
- display the radar PPI as an overlay on the ECDIS
- to turn On or Off the data transmission to the autopilot
- enter an deth alarm for an integrated echosounder (if an echosounder is available)
- to specify whether wind and current information displayed relative to own ship or true wind speed and direction
- showing the received Navtex messages
- to specify the ship's dimensions: specifies location of navigation device antennas relative to bow and port side
- the ECDIS system clock is set to UTC
- release USB storage device

HELP MENU (chapter 13)
- shows the online documentation
- shows detailed system information
- shows the software version and the copyright information
Menu Bar

- Main
- Charts
- S-57 Options
- Display
- Ship
- Routes
- Nav Tools
- Plot Layer
- Logs
- Integration
- Help

Tool Bar

- Previous/Next
- Free Zoom
- Zoom In/Out
- Center On Ship
- Free EBL
- Fixed EBL
- Mark At Ship
- Manual 24 Hour Log Entries
- NavTex Dialog (*)
- Toggle ARCS/S57
- Select Chart
- Select Infopanel
- MOB

Cursor Symbols

- Chart Area
- Target
- Menus / Dialogs
- Digitizer Puck
- Display Scroll down
- Display Scroll left
- Display Scroll right
- Display Scroll up
- Zoom In
- Vertical bar
- Change the window size
- Radar Cursor (A,B,C...)

Operator Control

Starting the ECDIS chapter 2.1.4

Trackball

chapter 2.1.6

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## GLOSSARY OF TERMS

**NOTE**

Many of these definitions have been adapted from the “Glossary of ECDIS-Related Terms,” published by the International Hydrographic Bureau, 2nd Edition, September 1993.

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<td>VISUAL, ACOUSTICAL OR RADIO DEVICES EXTERNAL TO A CRAFT DESIGNED TO ASSIST IN THE DETERMINATION OF A SAFE COURSE OR OF A VESSEL'S POSITION, OR WARN OF DANGERS AND OBSTRUCTIONS.</td>
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<tr>
<td>AIS</td>
<td>AUTOMATIC IDENTIFICATION SYSTEM IS AN EXTERNAL DEVICE TO IDENTIFY SHIPS IN THE AREA NEARBY (USER ID, CALL SIGN, NAME, SHIP &amp; CARGO TYPE, CPA/TCPA, DISTANCE/BEARING, NAV STATUS, POSITION). THE ECDIS DISPLAYS THIS SHIPS AS SPECIAL SYMBOLS AT THE CURRENT CHART.</td>
</tr>
<tr>
<td>AML</td>
<td>ADDITIONAL MILITARY LAYERS</td>
</tr>
<tr>
<td>ARCS</td>
<td>ADMIRALITY RASTER CHART SERVICE</td>
</tr>
<tr>
<td>AREA</td>
<td>A NAMED AND SAVED DISPLAY DIMENSION (SCALE AND CENTER).</td>
</tr>
<tr>
<td>ARPA</td>
<td>THE ABBREVIATION FOR AUTOMATIC RADAR PLOTTING AID. A SYSTEM WHEREIN RADAR TARGETS ARE AUTOMATICALLY ACQUIRED AND TRACKED.</td>
</tr>
<tr>
<td>ARROW KEYS</td>
<td>THE UP, DOWN, LEFT, OR RIGHT ARROW KEYS.</td>
</tr>
<tr>
<td>ASCII</td>
<td>AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE</td>
</tr>
<tr>
<td>ASSA</td>
<td>ADAPTIVE STEERING &amp; STABILIZING AUTOPILOT</td>
</tr>
<tr>
<td>BA</td>
<td>BRITISH ADMIRALITY</td>
</tr>
<tr>
<td>BEARING</td>
<td>ALL BEARINGS DISPLAYED IN PATHFINDER®/ST MK2 ECDIS ARE TRUE BEARINGS (VS. MAGNETIC OR COMPASS).</td>
</tr>
<tr>
<td>BMP</td>
<td>BITMAP</td>
</tr>
<tr>
<td>CANCEL</td>
<td>THE CANCEL KEY OR CANCEL COMMAND BUTTON; IT CANCELS A COMMAND.</td>
</tr>
<tr>
<td>CASCADING MENUS</td>
<td>A SUB MENU THAT OPENS WHEN YOU SELECT A COMMAND FROM ANOTHER MENU. CASCADING MENUS ARE INDICATED BY A TRIANGLE TO THE RIGHT OF A COMMAND NAME.</td>
</tr>
<tr>
<td>CAUTIONARY NOTE</td>
<td>INFORMATION CALLING SPECIAL ATTENTION TO SOME FACT, USUALLY A DANGER AREA SHOWN ON A CHART, OR OTHER PUBLICATION.</td>
</tr>
<tr>
<td>CCRP</td>
<td>CONSISTENT COMMON REFERENCE POINT</td>
</tr>
<tr>
<td>CCRS</td>
<td>CONSISTENT COMMON REFERENCE SYSTEM</td>
</tr>
<tr>
<td>CD</td>
<td>COMPACT DISK</td>
</tr>
<tr>
<td>CDC</td>
<td>CONNING DISPLAY COMPACT</td>
</tr>
<tr>
<td>CENTER</td>
<td>THE COORDINATES ON WHICH THE DISPLAY IS CENTERED.</td>
</tr>
<tr>
<td>CHART</td>
<td>A CHART SPECIFICALLY DESIGNED TO MEET REQUIREMENTS OF MARINE NAVIGATION, SHOWING DEPTHS OF WATER, NATURE OF BOTTOM, ELEVATIONS, CONFIGURATION AND CHARACTERISTICS OF COAST, DANGERS AND AIDS TO NAVIGATION.</td>
</tr>
<tr>
<td>CHECK BOX</td>
<td>THE SMALL SQUARE BOXES, WITHIN A DIALOG BOX, THAT ARE EITHER SELECTED OR CLEARED. WHEN A CHECK BOX IS SELECTED, AN &quot;X&quot; APPEARS IN THE BOX.</td>
</tr>
<tr>
<td>CLICK</td>
<td>PRESS THEN QUICKLY RELEASE THE [LEFT] TRACKBALL BUTTON; SEE ALSO &quot;POINT AND CLICK&quot;.</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>CLICK AND DRAG</td>
<td>A TRACKBALL TECHNIQUE IN WHICH YOU POINT TO AN ITEM OF CHOICE, PRESS THE [Left] TRACKBALL BUTTON, MOVE THE CURSOR TO THE DESIRED POSITION, THEN RELEASE THE BUTTON.</td>
</tr>
<tr>
<td>COG</td>
<td>COURSE OVER GROUND</td>
</tr>
<tr>
<td>COL</td>
<td>COLOR</td>
</tr>
<tr>
<td>COMMAND</td>
<td>A WORD OR PHRASE FOUND IN A MENU. SELECTING A COMMAND CAUSES THE APPLICATION TO PERFORM AN ACTION OR OPEN A DIALOG BOX.</td>
</tr>
<tr>
<td>COMMAND BUTTONS</td>
<td>THE RECTANGULAR BOXES, WITHIN A DIALOG BOX, THAT EITHER PERFORM OR CANCEL AN ACTION. &quot;OK&quot; AND &quot;CANCEL&quot; ARE TWO COMMON COMMAND BUTTONS.</td>
</tr>
<tr>
<td>COMPIL</td>
<td>THE SELECTION, ASSEMBLY, AND GRAPHIC REPRESENTATION OF ALL RELEVANT INFORMATION REQUIRED FOR THE PREPARATION OF A NEW MAP/CHART. SUCH INFORMATION MAY BE DERIVED FROM OTHER MAPS/CHARTS.</td>
</tr>
<tr>
<td>COURSE</td>
<td>THE DIRECTION IN WHICH THE SHIP IS TRAVELING. IT IS MEASURED FROM 0 (AT NORTH, CLOCKWISE TO 360). THE COURSE IS THE DIRECTION TO BE STEERED.</td>
</tr>
<tr>
<td>COURSE CONTROL</td>
<td>ONE OF PATHFINDER/ST ECDIS'S MODES OF OPERATION. IT IS DEFINED BY AN ELECTRONIC HEADING, RATE OF TURN AND TURNING RADIUS, AND STEERING MAY BE DONE MANUALLY OR BY THE AUTOPILOT.</td>
</tr>
<tr>
<td>COURSE LINE</td>
<td>THE DOTTED LINE THAT PATHFINDER®/ST MK2 ECDIS DRAWS FROM THE SHIP'S POSITION TO THE ACTIVE WAYPOINT.</td>
</tr>
<tr>
<td>COURSE MADE GOOD</td>
<td>THE ACTUAL TRACK MADE GOOD OVER THE GROUND (THE SEABED); THE DIRECTION OF THE POINT OF ARRIVAL FROM THE POINT OF DEPARTURE. COURSE MADE GOOD IS THE DIRECTION COMPONENT RESULTING FROM THE SHIP'S VELOCITY AND THE WATER CURRENT, SHOULD NOT BE CONFUSED WITH SHIP'S HEADING.</td>
</tr>
<tr>
<td>CPA</td>
<td>CLOSEST POINT OF APPROACH</td>
</tr>
<tr>
<td>CROSS-TRACK ERROR</td>
<td>THE PERPENDICULAR DISTANCE BETWEEN THE SHIP'S TRACK AND THE INTENDED COURSE. ALSO ABBREVIATED &quot;XTE&quot;.</td>
</tr>
<tr>
<td>CROSSTRAIRS</td>
<td>THE CURSOR SHAPE FOR POSITIONING OBJECTS IN THE DISPLAY.</td>
</tr>
<tr>
<td>CURSOR</td>
<td>THE ON SCREEN ARROW (OR OTHER SYMBOL) USED TO PLACE AND SELECT OBJECTS ON THE DISPLAY, AND SELECT MENUS, COMMAND AND AREAS IN DIALOG BOXES.</td>
</tr>
<tr>
<td>DATUM</td>
<td>A SET OF PARAMETERS SPECIFYING THE REFERENCE SURFACE OR THE REFERENCE COORDINATE SYSTEM USED FOR GEODETIC CONTROL IN THE CALCULATION OF COORDINATES OF POINTS ON THE EARTH.</td>
</tr>
<tr>
<td>DGPS</td>
<td>DIFFERENTIAL GLOBAL POSITIONING SYSTEM</td>
</tr>
<tr>
<td>DIALOG BOXES</td>
<td>RECTANGULAR BOXES DISPLAYED WHEN PATHFINDER®/ST MK2 ECDIS REQUIRES MORE INFORMATION BEFORE EXECUTING A COMMAND. DIALOG BOXES ALSO DISPLAY WARNING MESSAGES AND OTHER INFORMATION.</td>
</tr>
<tr>
<td>DIGITIZING</td>
<td>THE PROCESS OF CONVERTING PAPER CHART INFORMATION INTO DIGITAL DATA.</td>
</tr>
<tr>
<td>DISPLAY</td>
<td>THE PORTION OF THE SCREEN IN WHICH PATHFINDER®/ST MK2 ECDIS DISPLAYS SHIP TRACKS, ROUTES, MARKERS, LINES AND ELECTRONIC CHARTS.</td>
</tr>
<tr>
<td>DOTTED BOX</td>
<td>THE FOCUS RECTANGLE; WITHIN A DIALOG BOX, THE DOTTED TRIANGLE WHICH SIGNALS THE ACTIVE AREA.</td>
</tr>
<tr>
<td>DR</td>
<td>DEAD RECKONING</td>
</tr>
<tr>
<td>EBL</td>
<td>ELECTRONIC BEARING LINE</td>
</tr>
<tr>
<td>ECDIS</td>
<td>THE ABBREVIATION FOR &quot;ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM&quot;.</td>
</tr>
<tr>
<td>ENC</td>
<td>ELECTRONIC NAVIGATIONAL CHART - THE DATABASE, STANDARDIZED AS TO CONTENT, STRUCTURE AND FORMAT, ISSUED FOR USE WITH ECDIS ON THE AUTHORITY OF GOVERNMENT AUTHORIZED HYDROGRAPHIC OFFICES. THE ENC CONTAINS ALL OF THE CHART INFORMATION NECESSARY FOR SAFE NAVIGATION AND MAY CONTAIN SUPPLEMENTARY INFORMATION IN ADDITION TO THAT CONTAINED IN THE PAPER CHART WHICH MAY BE CONSIDERED NECESSARY FOR SAFE NAVIGATION.</td>
</tr>
<tr>
<td>ETA</td>
<td>ESTIMATED TIME OF ARRIVAL</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ETZ</td>
<td>EASTERN TIME ZONE</td>
</tr>
<tr>
<td>FAIRLANES</td>
<td>THE AREA, SPECIFIED BY THE CROSS-TRACK ERROR ALARM DISTANCE, OF THE ROUTE</td>
</tr>
<tr>
<td></td>
<td>WHICH HAS BEEN CHECKED FOR ANTI-GROUNDING.</td>
</tr>
<tr>
<td>GLOBAL LAYER</td>
<td>ONE OF THREE LAYERS OF INFORMATION THAT APPEAR IN THE DISPLAY. THE GLOBAL</td>
</tr>
<tr>
<td></td>
<td>LAYER CONTAINS THE LATITUDE/LONGITUDE GRID AND RECORDED DEPTH POINTS. SEE ALSO “PLOT LAYER”.</td>
</tr>
<tr>
<td>GPS</td>
<td>GLOBAL POSITIONING SYSTEM, A SATELLITE NAVIGATION SYSTEM INTENDED TO PROVIDE</td>
</tr>
<tr>
<td></td>
<td>HIGHLY ACCURATE POSITION AND VELOCITY INFORMATION IN THREE DIMENSIONS AND</td>
</tr>
<tr>
<td></td>
<td>CONTINUOUS PRECISE TIME AND TRAVEL INTERVAL ON A GLOBAL BASIS.</td>
</tr>
<tr>
<td>HARD DISK DRIVE</td>
<td>THE COMPUTER COMPONENT THAT PERMANENTLY STORES INFORMATION.</td>
</tr>
<tr>
<td>HDOP</td>
<td>HORIZONTAL DILUTION OF RECISION</td>
</tr>
<tr>
<td>HEADING</td>
<td>THE DIRECTION IN WHICH THE CRAFT IS POINTED (NOT TRAVELING, PLEASE SEE COURSE). ALL</td>
</tr>
<tr>
<td></td>
<td>HEADINGS DISPLAYED ON PATHFINDER/ST MK2 ECDIS ARE TRUE HEADINGS, EXPRESSED IN DEGREES FROM</td>
</tr>
<tr>
<td></td>
<td>NORTH.</td>
</tr>
<tr>
<td>HIGH RESOLUTION TRACK</td>
<td>THE MOST PRECISE REPRESENTATION OF THE SHIP’S TRACK AVAILABLE WITH PATHFINDER/ST ECDIS.</td>
</tr>
<tr>
<td></td>
<td>DISPLAYED ONLY IN REAL TIME, IT CANNOT BE SAVED IN A PLOT.</td>
</tr>
<tr>
<td>HIGHLIGHTED</td>
<td>INDICATES THAT AN OBJECT OR TEXT IS SELECTED. THE TEXT WILL APPEAR IN A DIFFERENT COLOR.</td>
</tr>
<tr>
<td>HOURGLASS</td>
<td>THE CURSOR SHAPE THAT APPEARS WHEN THE PATHFINDER/ST MK2 ECDIS PROGRAM NEEDS A FEW SECONDS</td>
</tr>
<tr>
<td></td>
<td>TO EXECUTE A COMMAND.</td>
</tr>
<tr>
<td>ICON</td>
<td>A PICTORIAL REPRESENTATION OF A PROGRAM OR FILE.</td>
</tr>
<tr>
<td>ID</td>
<td>IDENTIFICATION</td>
</tr>
<tr>
<td>IEC</td>
<td>INTERNATIONAL ELECTRO TECHNICAL COMMISSION</td>
</tr>
<tr>
<td>IHO</td>
<td>INTERNATIONAL HYDROGRAPHIC ORGANIZATION. COORDINATES THE ACTIVITIES OF NATIONAL HYDROGRAPHIC</td>
</tr>
<tr>
<td></td>
<td>OFFICES; PROMOTES STANDARDS AND PROVIDES ADVICE TO DEVELOPING COUNTRIES IN THE FIELDS OF</td>
</tr>
<tr>
<td></td>
<td>HYDROGRAPHIC SURVEYING AND PRODUCTION OF NAUTICAL CHARTS AND PUBLICATIONS.</td>
</tr>
<tr>
<td>IMO</td>
<td>INTERNATIONAL MARITIME ORGANIZATION. FORMALLY CALLED IMCO, THE IMO IS THE SPECIALIZED</td>
</tr>
<tr>
<td></td>
<td>AGENCY OF THE UNITED NATIONS RESPONSIBLE FOR MARITIME SAFETY AND EFFICIENCY OF NAVIGATION.</td>
</tr>
<tr>
<td>INS</td>
<td>INTEGRATED NAVIGATION SYSTEM</td>
</tr>
<tr>
<td>Lat/Long</td>
<td>LATITUDE/LONGITUDE</td>
</tr>
<tr>
<td>LINE MARK</td>
<td>THE POINT THAT MARKS THE BEGINNING OF A LINE.</td>
</tr>
<tr>
<td>LIST BOX</td>
<td>AN AREA, WITHIN A DIALOG BOX. CLICKING ON THE DOWN POINTING ARROW LOCATED NEXT TO THE LIST</td>
</tr>
<tr>
<td></td>
<td>BOX WILL DISPLAY A LIST OF AVAILABLE CHOICES.</td>
</tr>
<tr>
<td>LOP (RADIO)</td>
<td>LINE OF POSITION</td>
</tr>
<tr>
<td>MANUAL CONTROL</td>
<td>ONE OF PATHFINDER/ST ECDIS’S MODES OF OPERATION. IN THIS MODE, ECDIS IS NOT CONTROLING THE</td>
</tr>
<tr>
<td></td>
<td>PHYSICAL AUTOPILOT.</td>
</tr>
<tr>
<td>MARKER</td>
<td>A SYMBOL USED TO MARK A LOCATION OR EVENT.</td>
</tr>
<tr>
<td>MARKER LABEL</td>
<td>THE LABEL ADDED TO A MARKER. PATHFINDER/ST ECDIS’S LABELING OPTIONS INCLUDE USER-DEFINED</td>
</tr>
<tr>
<td></td>
<td>TEXT, THE CURRENT TIME, OR SEQUENTIAL NUMBERS.</td>
</tr>
<tr>
<td>MENU</td>
<td>A LIST OF COMMANDS.</td>
</tr>
<tr>
<td>MENU BAR</td>
<td>AT THE TOP OF THE WINDOW, THE BAR THAT CONTAINS THE APPLICATION’S MENU NAMES.</td>
</tr>
<tr>
<td>MFC SWITCHER</td>
<td>MULTIFUNCTION CONSOLE SWITCHER (RADAR, ECDIS, NAUTOCONNING)</td>
</tr>
<tr>
<td>MOB</td>
<td>THE ABBREVIATION FOR “MAN OVERBOARD”.</td>
</tr>
<tr>
<td>MMD</td>
<td>MARITIME MULTI DISPLAY.</td>
</tr>
<tr>
<td>MMSI</td>
<td>MARITIME MOBILE SERVICE IDENTITY</td>
</tr>
<tr>
<td>MOUSE</td>
<td>A REMOTE POINTING DEVICE. ALSO REFERRED TO AS A TRACKBALL.</td>
</tr>
<tr>
<td>MSG</td>
<td>MESSAGE</td>
</tr>
<tr>
<td>NAV panel</td>
<td>NAVIGATION PANEL</td>
</tr>
<tr>
<td>NAVIGATIONAL AID</td>
<td>ANY INSTRUMENT, DEVICE, CHART, METHOD, ETC., USED ONBOARD, INTENDED TO ASSIST IN THE</td>
</tr>
<tr>
<td></td>
<td>NAVIGATION OF A CRAFT.</td>
</tr>
<tr>
<td>NLT</td>
<td>NOT LESS THAN</td>
</tr>
<tr>
<td>NM</td>
<td>NAUTICAL MILES</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NMT</td>
<td>NOT MORE THAN</td>
</tr>
<tr>
<td>NMEA</td>
<td>NATIONAL MARINE ELECTRONICS ASSOCIATION</td>
</tr>
<tr>
<td>NOAA</td>
<td>NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</td>
</tr>
<tr>
<td>NORTH-UP DISPLAY</td>
<td>WHEN THE INFORMATION IS SHOWN ON THE DISPLAY (RADAR OR ECDIS) ALWAYS WITH THE NORTH DIRECTION AT THE TOP OF THE MONITOR. CORRESPONDS TO THE ORIENTATION OF THE NAUTICAL CHARTS BUT DIFFER FROM THE VIEW FROM THE SHIP'S BRIDGE IN THE DIRECTION OF THE SHIP'S HEADING.</td>
</tr>
<tr>
<td>NOTICE TO MARINERS</td>
<td>A PERIODICAL OR CASUAL NOTICE ISSUED BY HYDROGRAPHIC OFFICES, OR OTHER COMPETENT AUTHORITIES, REGARDING CHANGES IN AIDS TO NAVIGATION, DANGERS TO NAVIGATION, IMPORTANT NEW SOUNDINGS, AND, IN GENERAL, ALL SUCH INFORMATION AS AFFECTS NAUTICAL CHARTS, SAILING DIRECTIONS, LIGHT LISTS AND NAUTICAL PUBLICATIONS.</td>
</tr>
<tr>
<td>OPTION BUTTONS</td>
<td>THE SMALL CIRCULAR BUTTONS WITHIN A DIALOG BOX, WHICH ARE EITHER SELECTED OR CLEARED. WHEN AN OPTION BUTTON IS SELECTED ITS CENTER IS DARKENED.</td>
</tr>
<tr>
<td>OSK</td>
<td>ON SCREEN KEYBOARD</td>
</tr>
<tr>
<td>OVERSCALE</td>
<td>DISPLAYING DATA AT A LARGER SCALE THAN FOR WHICH IT WAS COMPiled.</td>
</tr>
<tr>
<td>PLANNED TRACK</td>
<td>THE COURSE LINE BETWEEN THE WAYPOINTS; IS RED IN COLOR AND APPEARS AS A SOLID LINE BETWEEN WAYPOINTS AND A DASHED LINE BETWEEN THE SHIP AND THE ACTIVE WAYPOINT.</td>
</tr>
<tr>
<td>PLANNED TURNING ARC</td>
<td>RED IN COLOR; THE TURNING ARC WHICH IS ESTABLISHED AS YOU ENTER A WAYPOINT.</td>
</tr>
<tr>
<td>PLOT</td>
<td>A COLLECTION OF INFORMATION THAT HAS BEEN NAMED, THEN SAVED ON THE HARD DISK.</td>
</tr>
<tr>
<td>PLOT LAYER</td>
<td>ONE OF THREE LAYERS OF INFORMATION THAT APPEAR IN THE DISPLAY. THE PLOT LAYER CONTAINS RECORDED TRACKS, PLOT LINES, AND PLOT MARKERS. INFORMATION IN THIS LAYER CAN BE STORED IN A PLOT. SEE ALSO “GLOBAL LAYER”.</td>
</tr>
<tr>
<td>PMT</td>
<td>PROGRAM MAP TABLE</td>
</tr>
<tr>
<td>POINT AND CLICK</td>
<td>A TRACKBALL TECHNIQUE IN WHICH YOU POINT TO AN ITEM OF CHOICE, THE QUICKLY PRESS AND RELEASE THE [Left] TRACKBALL BUTTON.</td>
</tr>
<tr>
<td>PREDICTED TURNING ARC</td>
<td>BLACK IN COLOR; THE TURNING ARC THE SHIP WILL TAKE GIVEN THE SHIP'S CURRENT SPEED AND PLANNED RATE OF TURN (ENTERED IN THE AUTOPILOT DIALOG BOX).</td>
</tr>
<tr>
<td>RCDS</td>
<td>RASTER CHART DISPLAY SYSTEM</td>
</tr>
<tr>
<td>RECORDED TRACK</td>
<td>THE SHIP’S TRACK COMPOSED OF TRACK POINTS RECORDED AT A USER-DEFINED INTERVAL.</td>
</tr>
<tr>
<td>RENC</td>
<td>REGIONAL ENC COORDINATING CENTER</td>
</tr>
<tr>
<td>RNCs</td>
<td>RASTER NAUTICAL CHARTS</td>
</tr>
<tr>
<td>RPM</td>
<td>REVOLUTIONS PER MINUTE</td>
</tr>
<tr>
<td>RPN</td>
<td>RAYTHEON PART NUMBER</td>
</tr>
<tr>
<td>ROUTE MONITORING</td>
<td>THE OPERATIONAL NAVIGATIONAL ECDIS FUNCTION IN WHICH THE CHART INFORMATION IS EITHER DISPLAYED, UNDER CONTROL OF THE POSITIONING SENSOR INPUT, ACCORDING TO THE VESSEL'S PRESENT POSITION (EITHER IN TRUE MOTION)</td>
</tr>
<tr>
<td>ROUTES</td>
<td>A COLLECTION OF WAYPOINTS THAT CAN BE NAMED AND SAVED.</td>
</tr>
<tr>
<td>RTE</td>
<td>ROUTE</td>
</tr>
<tr>
<td>SAFETY CONTOUR</td>
<td>THE CONTOUR RELATED TO THE OWN SHIP AND USED BY THE ECDIS TO DISTINGUISH ON THE DISPLAY BETWEEN SAFE AND THE UNSAFE WATER, AND FOR GENERATING ANTI-GROUNDING ALARMS. THE SAFETY CONTOUR INFORMATION IS ENTERED IN THE SHIP INFO DIALOG BOX (INTEGRATION MENU).</td>
</tr>
<tr>
<td>SAR</td>
<td>SEARCH AND RESCUE</td>
</tr>
<tr>
<td>SCALE</td>
<td>THE RATIO BETWEEN THE LINEAR DIMENSIONS OF A CHART, MAP, DRAWING ETC., AND THE ACTUAL DIMENSIONS REPRESENTED. IT MAY ALSO BE CALLED CHART SCALE OR MAP SCALE WHEN APPLIED TO A CHART OR A MAP.</td>
</tr>
<tr>
<td>SCROLL BAR</td>
<td>THE BAR AT THE RIGHT SIDE OF A LIST BOX WHICH ALLOWS YOU TO SCROLL THE CONTENTS.</td>
</tr>
<tr>
<td>SENC</td>
<td>SYSTEM ELECTRONIC NAVIGATION CHART</td>
</tr>
<tr>
<td>SHIP AUTOCENTER</td>
<td>WHEN ON, THIS FEATURE CAUSES PATHFINDER®/ST MK2 ECDIS TO MOVE THE DISPLAY SO THAT THE SHIP IS ALWAYS IN VIEW.</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SHIP MARK</td>
<td>AN &quot;X&quot; PLACED AT THE SHIP’S POSITION AND LABELED WITH THE TIME.</td>
</tr>
<tr>
<td>SOG</td>
<td>SPEED OVER GROUND</td>
</tr>
<tr>
<td>SOLAS</td>
<td>INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA DEVELOPED BY IMO. THE CONTRACTING GOVERNMENTS UNDERTAKE TO PROMULGATE ALL LAWS, DECREES, ORDERS, AND REGULATION AND TO TAKE ALL OTHER STEPS WHICH MAY BE NECESSARY TO GIVE THE PRESENT CONVENTION FULL AND COMPLETE EFFECT, SO AS TO ENSURE THAT, FROM THE POINT OF VIEW OF SAFETY OF LIFE, A SHIP IS FIT FOR THE SERVICE FOR WHICH IT IS INTENDED (ARTICLE 18 OF SOLAS).</td>
</tr>
<tr>
<td>TARGET</td>
<td>THE CURSOR SHAPE FOR SELECTING ITEMS TO BE DELETED OR MODIFIED.</td>
</tr>
<tr>
<td>TCPA</td>
<td>TIME OF CLOSEST POINT OF APPROACH</td>
</tr>
<tr>
<td>TEXT BOXES</td>
<td>A BOX, WITHIN A DIALOG BOX, WHICH IS USED FOR ENTERING AND EDITING TEXT.</td>
</tr>
<tr>
<td>TID</td>
<td>TENDER IDENTIFICATION</td>
</tr>
<tr>
<td>TITLE BAR</td>
<td>THE BAR ACROSS THE TOP OF THE WINDOW THAT CONTAINS THE NAME OF THE PROGRAM.</td>
</tr>
<tr>
<td>TFT DISPLAY</td>
<td>THIN FILM TRANSISTOR DISPLAY.</td>
</tr>
<tr>
<td>TOC</td>
<td>TIME ON CHANNEL</td>
</tr>
<tr>
<td>TOGGLE COMMAND</td>
<td>A COMMAND THAT ALTERNATES BETWEEN TWO STATES, ON OR OFF.</td>
</tr>
<tr>
<td>TOOL BAR</td>
<td>LOCATED BELOW THE MENU BAR, IT PROVIDES FAST AND EASY ACCESS TO MANY MENU CHOICES.</td>
</tr>
<tr>
<td>TOV</td>
<td>TIME OF VALIDITY</td>
</tr>
<tr>
<td>TPL</td>
<td>TRANSFERRRED POSITION LINE</td>
</tr>
<tr>
<td>TRACK</td>
<td>THE ACTUAL PATH OR ROUTE OF A CRAFT OVER THE GROUND OR SEA BOTTOM (OR IT'S GRAPHICAL REPRESENTATION).</td>
</tr>
<tr>
<td>TRACK CONTROL</td>
<td>ONE OF PATHFINDER/ST ECDIS'S MODES OF OPERATION. IT IS DEFINED BY AN OPEN ROUTE WITH ESTABLISHED WAYPOINTS, A TURNING RADIUS. STEERING MAY BE DONE MANUALLY OR BY THE AUTOPILOT.</td>
</tr>
<tr>
<td>TRACKBALL</td>
<td>A DEVICE FOR CONTROLLING THE POINTER.</td>
</tr>
<tr>
<td>TransMerc</td>
<td>TRANSVERSE MERCATOR</td>
</tr>
<tr>
<td>TRUE MOTION</td>
<td>THE VESSEL’S COURSE AND SPEED OVER GROUND.</td>
</tr>
<tr>
<td>TTC</td>
<td>TENDER TRANSMIT CODE</td>
</tr>
<tr>
<td>UNDERSCALE</td>
<td>THE SITUATION WHERE THE DATA DISPLAYED ARE NOT THE LARGEST SCALE DATA AVAIL-ABLE FOR THAT AREA.</td>
</tr>
<tr>
<td>USB</td>
<td>UNIVERSAL SERIAL BUS</td>
</tr>
<tr>
<td>USB-Stick</td>
<td>UNIVERSAL SERIAL BUS MEMORY STICK</td>
</tr>
<tr>
<td>UTC</td>
<td>UNIVERSAL TIME COORDINATED</td>
</tr>
<tr>
<td>VERTICAL BAR</td>
<td>THE CURSOR SHAPE FOR ENTERING AND EDITING TEXT.</td>
</tr>
<tr>
<td>VDU</td>
<td>VIDEO DISPLAY UNIT</td>
</tr>
<tr>
<td>VRM</td>
<td>VARIABLE RANGE MARKER</td>
</tr>
<tr>
<td>WAYPOINT</td>
<td>A SYMBOL USED TO MARK A LOCATION TO WHICH YOU WANT TO NAVIGATE. A GROUP OF WAYPOINTS COMPRISE A ROUTE.</td>
</tr>
<tr>
<td>WAYPOINT ALARM</td>
<td>THE ALARM THAT IS TRIGGERED AS YOU APPROACH THE ACTIVE WAYPOINT.</td>
</tr>
<tr>
<td>WIECDIS</td>
<td>WARSHIP ECDIS</td>
</tr>
<tr>
<td>WEND</td>
<td>WORLDWIDE ELECTRONIC NAVIGATIONAL CHART BASE</td>
</tr>
<tr>
<td>WGS</td>
<td>THE ABBREVIATION FOR &quot;WORLD GEODETIC SYSTEM&quot;, THIS SYSTEM WAS DEVELOPED BY THE USA FOR SATELLITE POSITION FIXING AND RECOMMENDED BY IHO FOR HYDRO- GRAPHIC AND CARTOGRAPHIC USE. WGS84 IS THE CURRENT SYSTEM IN USE (84 REFERS TO THE YEAR).</td>
</tr>
<tr>
<td>WINDOW</td>
<td>THE RECTANGULAR AREA IN WHICH MICROSOFT WINDOWSTM DISPLAYS PROGRAMS AND FILES.</td>
</tr>
<tr>
<td>WOP</td>
<td>WHEEL OVER POINT</td>
</tr>
<tr>
<td>WPT</td>
<td>WAYPOINT</td>
</tr>
<tr>
<td>XTE</td>
<td>CROSS TRACK ERROR - THE PERPENDICULAR DISTANCE BETWEEN THE SHIP’S TRACK AND THE INTENDED COURSE.</td>
</tr>
</tbody>
</table>
1 INTRODUCTION

ECDIS is an integrated software controlled navigation system with advanced electronic chart capabilities including:

- route planing
- route monitoring
- ground monitoring

It enables a navigator to conveniently do all navigational routines which are currently done on paper charts.

NOTE
This ECDIS 24 is an Aid To Navigation. Its accuracy can be affected by many factors such as equipment defect, environmental conditions, or improper operation. It is the user’s responsibility to exercise common prudence and navigational judgement at all times.

NOTE
We strongly recommend that any seafarer who uses this equipment should have completed an appropriate training course.

The ECDIS is designed to meet the requirements as defined by International Maritime Organization (IMO), International Electrotechnical Commission (IEC) and International Hydrographic Organization (IHO) (see also www.IHO.INT).

The ECDIS is compliant with the following IHO standards:

- S-52 Ed 6.0: Chart Content and Display Aspects of ECDIS
- Presentation Library Edition 3.4 (Annex A to S-52)
- S-57 Ed 3.1: Transfer Standard for Digital Hydrographic Data
- S-61 Ed 1.0: Raster Navigational Charts (optional)
- S-63 Ed 1.1: Data Protection Scheme
- S-64 Ed 1.1: Test Data Sets for ECDIS
The ECDIS takes information from various shipboard sensors, such as ARPA radar, AIS information, positioning devices and echo sounders, and integrates the information into easily interpreted visual displays.

**NOTE**

All charts are displayed in a "North-up" orientation. Datum is always WGS 1984 (*World Geodetic System*).

ECDIS chart capabilities are.

- **ENC**
  - IHO-S57
  - IHO-S63 (encrypted)
  - Jeppesen / C-MAP CM93/3 SENC distribution

- **Raster Charts (RNC)**
  - ARCS

- **Unofficial charts**
  - Jeppesen / C-MAP CM93/3 World or Professional + Database
1.1 Types Of Charts

ECDIS displays the type and scale of the displayed chart in the information panel. As you change the scale of the display, or center the display on other areas, the type of the chart being displayed may change, indicating that ECDIS is displaying a more appropriate chart. If the display is centered over a region not covered by any of the installed charts, no chart is displayed. For example, if you zoom in on an area, ECDIS displays the chart that features the most detailed coverage of that region; if you zoom out, it displays the chart that features broadest coverage. It also makes similar adjustments when you move the display to the left or right, and up or down.

While a chart is displayed, you may see red lines drawn on the display. These lines designate the different fragments of the paper charts. You may view the source of the chart; the chart name, manufacturer, date and much more by clicking the right mouse button.

1.1.1 Charting Capabilities for S57 (CM93/3) Chart Types

Legal Equivalence With Paper Charts

In order an ECDIS to be the legal equivalent of paper charts, the following conditions must be true:

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The system must display official ENC (Electronic Nautical Chart), issued by a national Hydrographic Office. The ENC must be up to date.</td>
</tr>
</tbody>
</table>

The ECDIS converts the ENC into a different format, called the SENC (System ENC) format.

A special module of the ECDIS software, the SENC Compiler, performs the conversion from ENC to SENC (chapter 4.7 Installation (import)).

The resulting data is loaded into a separate storage area, the SENC Database, where it is accessed by the chart display and navigational functions of ECDIS. The Jeppesen / C-Map CM93/3 databases provides tidal prediction for more than 7000 tide stations and information about more than 5000 ports and a global routing network for automatic route planning.
Following ECDIS functions are only available with the CM93/3 databases (except World database):

- Tidal Prediction (chapter 9.1.8).
- Automatic Route Planning and Port Information (chapter 9.1.9).

1.1.2 Charting Capabilities for ENC

The provision of a timely, reliable worldwide uniform ENC data distribution service is a major organizational challenge. The IHO developed the WEND (World-wide Electronic Navigational Chart Database) concept to meet these requirements. WEND consists of two components:

A charter describes the principles governing the cooperation between Hydrographic Offices e.g.:

- By definition, the organization responsible for charting of an area is also responsible for the ENC production.
- The relevant standards, especially S57 must be observed; and
- The rules of a recognized work quality assurance system (e.g., ISO 9000) should be applied to data production.

A conceptual schema describes a network of regional centers.

- Each so-called Regional Electronic Chart Coordinating Center (RENC) takes over the responsibility in its area for the collation of ENCs and updates for the region;
- Through the exchange of the regional data sets and their updates between all RENCs each RENC can offer an identical global data set for ECDIS; and
- RENCs do not deliver ENCs directly to ships. RENC customers are commercial chart data distributors who – in analogy to paper chart distribution – tailor individual sets of chart data for the special needs of a shipping company or a particular ship.

To date, two RENCs – Primar Stavanger, based in Norway and IC–ENC, based in the United Kingdom, are in operation. However, it has to be noted, that the WEND concept has not been fully adopted through all ENC producing nations yet. A number of nations are still distributing their ENCs individually (e.g. Japan...
Hydrographic Office, Australian Hydrographic Office, USA - NOAA) either through chart data suppliers or directly.

Principally, WEND focuses on the supply and distribution of ENCs by facilitating the establishment of services intended to satisfy the SOLAS carriage requirement for up-to-date charts. Within this primary purpose, ENCs are to be distributed in the encapsulation described in the S57 Standard. However, such “plain” S57 encapsulated ENCs may become easily subject to unauthorized amendment or illegal copying.

IHO has therefore issued the special publication S-63 “IHO Data Protection Scheme” as Standard for protection of ENCs by encryption. Encryption is a complex technical procedure: S-63 defines security constructs and operating procedures for the RENCs/chart data distributors and provides specifications that allow navigation equipment manufacturers to build S-63 compliant ECDIS. S-63 is already in use for ENC distribution and is supported by the noted two RENCs. Most major ECDIS manufacturers have implemented decryption procedures in conformance with S-63 within their systems.

1.1.3 Charting Capabilities for ARCS Chart Types

ARCS Seacharts (Raster-data-format)
ARCS means Admiralty Raster Chart Service. This institution scans seacharts of the British Admiralty (BA) in a raster-data-format. Such a manner scanned seacharts are available on CD-ROM as Raster Nautical Charts (RNCs) with a worldwide coverage.
A periodical update-service of the ARCS -seacharts is ensured by the manufacturer.
A seachart in raster-data-format is divided into pixels and then stored.
On the screen of the ECDIS these pixels will be displayed.
In this way the complete (paper-) chart equivalent is displayed on the screen. As additional information only the geographically coordinates are displayed (after selection by course) on the Information Panel.
Other, for seacharts typically information, as there are buoys, light beacons, wrecks or depth information can only be read out of the displayed seachart. The Zoom-function is reduced to 2 steps.
There is no object query possible on Raster charts.
2 DISPLAY ORGANIZATION

The pictures can differ from the deliveries.

Figure: 2-1 Display organization
2.1 FIRST STEPS IN OPERATION

This chapter describes following basic functions

- Starting the ECDIS (chapter 2.1.4)
- Terminating the ECDIS (chapter 2.1.5)
- How to use the CURSOR (chapter 2.1.6)

2.1.1 Light Sensor

Used to sense level of ambient light in the surrounding environment. The sensor data can be read by suitable software through the Hatteland Display SCOM functionality of the unit and thus can be used to control brightness remotely.

**NOTE**

This sensor is not visible for the eye or has any illumination behind to indicate it's position. Further, by touching or covering this area will naturally make the sensor data inaccurate.

2.1.2 Brightness

Brilliance / Brightness adjustment of the displayed image is adjusted by touching the (-) or (+) illuminated symbols.

The entire area of text and symbols are visible as long as the unit is powered.

Note that only the (-) and (+) are touch sensitive while the "*" and *BRILLIANCE* symbols are not.

2.1.3 ECDIS Status / Indicator

The text “ECDIS“ will illuminate in green constantly as long as the unit is powered. The “+“ and “-“ symbols will illuminate in red when the Brightness/Brilliance is adjusted either above or below ECDIS factory calibration point.

To be able to stay within ECDIS calibrated range, please assure that both the “+“ and “-“ are not illuminated and that “ECDIS“ text remains illuminated during
operation. Note that by touching these symbols no action will be performed or has been assigned.

2.1.4 Starting the ECDIS

Positioned on front, lower right side.

Pressing the button switches on the power.

Afterwards the respective software starts.

2.1.5 Terminating the ECDIS

Select Exit in the main menu.
The display changes to the Eggshell menu.
2.1.6 How to use the CURSOR

When using the trackball, the cursor is moved by rolling the ball in the appropriate direction.

The trackball is equipped with three buttons.

Left trackball key
This button is used as the Enter key.

There are two trackball techniques that you will use when working with ECDIS.

- “Point and click”
  Using the trackball, place the cursor e.g. over a command from the menu bar and press the button. The corresponding pull-down menu appears.

- “Point and drag” relating with Tool Bar function
  Using the trackball, place the cursor in the chart, press and hold the button. Drag the frame into the desired size. Release the button.
  The software zooms into the frame area. The displayed zoom resolution depends on the chart scale.

Right trackball key
Pointing the cursor at an object or anywhere on the display and clicking the button will cause a menu or dialog box to appear. The menu will provide a list of
commands indicating actions that can be performed on the object.

Middle trackball key
This button has no function.
2.2 MENU BAR

The ECDIS is a menu-driven program. To tell the ECDIS what to do, simply select a command from one of the ECDIS’s ten menus. The command name describes the function the ECDIS performs when you select it. Commands are accessed by the Menu Bar via cursor.

Via cursor
Each function is available by clicking on the Menu Command and using the pull-down menus.

Short Information, see Annex – 2 ECDIS First Menu Levels.

2.2.1 Pull down Menu

Select a menu name from the menu bar (e.g. Charts) per cursor. The following pull down menu, Figure: 2–2, appears. Select the desired function.

- The active pull down menu functions are colored in black.
- The passive pull down menu functions are colored in gray.

This passive function depends on:
- actual ECDIS function (e.g. Zoom in/out)
- optionally Program tool
- ECDIS system, connected with an Digitizing Table or Autopilot System

![Figure: 2–2 Menu Bar and pull down menu]
2.2.2 Menu Conventions

The ECDIS, like other Windows programs, follows certain conventions when listing command names:

1. **Ellipsis (…)** - Before it carries out the command, the ECDIS will prompt you for more information by displaying a dialog box.

2. **Check mark (✓)** - The command is a “toggle” command, one that is either on or off. The check mark indicates that the command is on or active. Selecting the command again turns it off and the check mark disappears.

3. **Grayed command** - The command is disabled. You cannot select the command at this time. If a command is grayed, your equipment may not be integrated correctly. For example, if the Use Sat Time command is grayed under the Event Log menu, either you do not have access to satellite time, or it is not integrated correctly.

4. **To activate a command**, first open the menu in which it is found, then select the command. You can activate commands using the trackball.

5. **The Screen Keyboards**
   This situation is recognized by the ECDIS software. On selecting an editing field, a context related keyboard (Figure: 2–3) appears. The operation is effectied via trackball.

---

![Figure: 2–3 Screen Keyboards](image-url)
2.3 USING THE WINDOWS AND DIALOG BOXES

(Annex-1 Windows and Cursor Symbols)

2.3.1 Closing a Menu

If you decide that you do not want to access a command, you can close a menu.

Closing a Menu with the Trackball
Point to any part of the screen outside the menu and click.

2.3.2 Using Dialog Boxes

When you activate a command followed by an ellipsis (...), ECDIS displays a dialog box. Dialog boxes are windows that present options or require you to make a selection or acknowledgment. Figure: 2-4 and Figure: 2-5 illustrate two of the ECDIS’s dialog boxes.

![Figure: 2-4 Scale and Center Dialog Box]
Dialog boxes contain many different areas: option buttons, text boxes, scroll bars, check boxes, command buttons, and list boxes. You will use these areas to provide the information ECDIS needs to execute a command. For example, when you select the **Open Route** command, ECDIS displays the Open Route dialog box. All saved routes appear in the list box. By selecting a name from the list, you tell ECDIS which route to open.
2.3.3 Moving in a Dialog Box

Figure: 2-6 Save Event in a Dialog Box

All dialog boxes contain a focus rectangle (dotted box) that appears either within an area or around its name, Figure: 2-6 (above). The focus rectangle indicates which area is “active”. For example, in the dialog box (Figure: 2-7), the active area is the Aids to Nav. - brief check box. The active area may also be highlighted (i.e., darkened).

2.3.3.1 Moving the Focus Rectangle (dotted box) with Trackball

Point and click on the desired area or item.
2.3.4 Command Buttons

Command buttons are the large rectangular buttons that either execute or cancel a command. The common command buttons are:

- "OK," which executes a command.
- "Cancel," which cancels a command without saving changes.
- "Quit," which closes a dialog box after saving changes.
- "Save" saves changes without closing the dialog box.

Command buttons are labeled according to the action they carry out: "Save" or "Open", for example. Selecting a command button is usually the last action you will take when working in a dialog box (Figure: 2-7).

![Command Buttons](image)

**Figure: 2-7  Command Buttons**

2.3.4.1 Select a Command Button with Trackball

Point and click on the desired command button.
2.3.5 List Boxes and Scroll Bars

List boxes display a list of choices (Figure: 2-8). For example, when you choose the Open Route command, the Open Route dialog box appears.

![Open Route List Box](image)

In the list box are the names of all the routes saved in the route list. You can select the route that you want to open from the list. When a list contains more items than can be displayed in the list box, Windows adds a scroll bar to the right side of the box.

Use the scroll bar to move the list up or down until hidden items become visible. These scroll bars can be activated with the trackball.

### 2.3.5.1 Select an Item in a List Box with Trackball

1) To reveal hidden information, click on the scroll bar arrow that points in the direction in which you want to scroll the list.

2) Point and click on the desired item.

**NOTE**

If you want to scroll through the list rapidly, use the small square—called a "thumb"—located between the arrows of the scroll bar. Point to the "thumb", press and hold down the [Left] button, then move the trackball so that the "thumb" slides along the scroll bar. Release the trackball button.
2.3.6 Text Boxes

Text boxes allow you to enter text information (Figure: 2-9). Some text boxes are multi-line text boxes. A scroll bar will appear next to the text box allowing you to scroll the text.

![Text Boxes (View Area)](Figure: 2-9 Text Boxes (View Area))

Some text boxes have spinners next to them (Figure: 2-10). By clicking on the arrows, you can increase or decrease the value in the text box.

![Spinners](Figure: 2-10 Text Boxes (Echosounder))

2.3.6.1 Entering Information in a Text Box with Trackball

1) Point and click in the text box.
2) Type the desired text.

The text appears at the cursor. If you make a mistake, use [Backspace] to erase characters one by one. Alternatively, use the trackball to point, click and drag the
cursor over the incorrect text (the text you select is highlighted).
When you start typing new text, the selected text disappears.
2.3.7 Using Option Buttons

Option buttons are the small circular buttons with labels beside them. Option buttons are either selected or cleared. Selected option buttons have dark centers; cleared option buttons have empty centers. Option buttons are usually mutually exclusive - that is, only one button in a group can be selected at a time.

Figure: 2-11 Option Buttons

2.3.7.1 Select or Clear an Option Button with Trackball

Point and click on the option button or its label.
2.3.8 Using Check Boxes

Check boxes are the small square boxes with labels beside them. Like option buttons, check boxes are either selected or cleared. When a check box is selected, an “✓” appears in the box. When a check box is cleared, the box is empty.

Figure: 2-12 Check Boxes

2.3.8.1 Selecting/Clearing a Check Box with Trackball

Point and click on the check box or its label.
2.3.9 Latitude/Longitude Boxes

Latitude and Longitude boxes are 2 areas grouped together in a box: a Degrees/minutes text box, in which you enter degrees/minutes;

<table>
<thead>
<tr>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>N 36°03.489'</td>
<td>W 005°20.993'</td>
</tr>
</tbody>
</table>

Figure: 2-13 Latitude and Longitude Boxes

2.3.9.1 Specify a Coordinate Using the Trackball

1) Type the desired hemisphere.
2) Click in the Degrees text box, then type the degrees.

NOTE
If the text box currently contains a value that you want to change, click on that text, then type the correct value.

3) Click in the Minutes text box, then type the minutes. If you express minutes to the tenth or hundredth of a minute, be sure to include the decimal point (.)

NOTE
If the text box currently contains a value that you want to change, click on that text, then type the correct value.
2.3.10 **Activate the Chart or Object Info window**

ECDIS is an “object oriented” program. Pointing the cursor at an object or anywhere on the display and clicking the [middle] trackball button will cause a menu or dialog box to appear. The menu will provide a list of commands indicating actions that can be performed on the object. For example, pointing and clicking at a marker will make the following menu appear:

![Change Marker...](image)

![Delete](image)

Figure: 2–14 Right Trackball menu

Pointing and clicking in the display area (Charts object) causes the Chart Objects dialog box to appear. It displays a list of objects located on the chart within the area at which you pointed the cursor. You may then point and click [Left] on each item listed (in the objects area). Information about that object is then displayed in the Properties area of the dialog box.

![Chart Objects](image)

Figure: 2–15 Chart Objects for C-MAP 93/2 chart format

**Object info**

The Object info window contains all information about a selected object (Buoys, wrecks or special sea areas) in the actual chart. Some time the object window (right site) displays a text line with the indication `.txt` or `.tif` at the end. These are special object infos. Click on this text line, an additional info displays (.txt for text info and .tif for picture info, Figure: 2–18). Select an **Objects:**
All objects to choose from are managed in a library shown in this window. The objects can be selected via cursor from a tree-like icon directory (Figure: 2-16).

![Object Info](image)

**Figure: 2-16  Object info for S-57 chart format**

Select an **Object and Send to Radar**

Objects with special info (e.g. coastline or restricted area) activates the **Send to Radar** button in the Object Info window (Figure: 2-17).

To transfer e.g. the coastline to the Raytheon Radar you have to push the **Send to Radar** button. The coastline appears on the Radardisplay.

---

**NOTE**

For this Function the ECDIS chart and chart scale must be synchronized with the current radar contact.
Figure: 2-17  Object info and Send to Radar function

Information in .tif format.

Information in .txt format.

Figure: 2-18  Special object infos
2.4 TOOL BAR

The toolbar, Figure: 2-19, (below) provides quick access to many ECDIS commands.

1) Previous View - Retrieves the view which was displayed prior to the current view. ECDIS is capable of remembering up to 30 views.

2) Next View - Opens the view which was displayed after the current view. ECDIS is capable of remembering up to 30 views.

3) Free Zoom In - Zooms into the frame area using the trackball “Point and drag” chapter 2.1.6. The displayed zoom resolution depends on the chart scale.

4) Zoom In - Zooms in the display, keeping the same “center” location. Please see “The Zoom Feature”, chapter 6.1.1.

5) Zoom Out - Redraws the current view at a scale one-and-one-half times larger. Please see “The Zoom Feature”, chapter 6.1.1.

6) Center on Ship - Centers the display on the ship’s location. Please see “Tunning ON or OFF Autocenter”, chapter 6.1.6.1.

7) Free EBL - Allows you to draw an electronic bearing line which displays the range and bearing from one point to another. Please see “Electronic Bearing Line”, chapter 9.1.1.

8) Fixed EBL - Allows you to draw an electronic bearing line which displays
the range and bearing from the ship to a set point. Please see “Electronic Bearing Line”, chapter 9.1.1.

9) Mark At Ship – Places a mark at the ship's current location. Please see “Placing Ship Marks”, chapter 7.1.4.

10) LOG - Opens the Manual 24 Hour Log Entry dialog box chapter 11.1.3 .

11) NAVTEX - The NavTex messages are automatically stored and can be displayed in the NavTex window (OPTION).

12) Toggle ARCS/S57

13) Select Chart - Opens the Select Chart dialog box allowing you to select/view a different chart for the area.

14) Select Infopanel

15) MOB – Starts the Man Overboard process. Please see “Man Overboard”, chapter 7.1.7.

16) Standard Display, switches to Standard presentation.

17) Displays the Radar Overlay (OPTION).

18) Select ARPA Overlay.

19) Select AIS Overlay.

20) Select Tender Tracking (OPTION)

21) Select Weather Overlay, chapter 16 (OPTION).

22) Select Customization, chapter 2.4.2.
2.4.1 Pull down Menu

The Tool Bar Keys ARPA Overlay, AIS Overlay and Tender Tracking are equipped with a pull down menu function.

Select a key from the Tool Bar (e.g. ) per cursor.

The following pull down menu, Figure: 2-20, appears.

![Tool Bar pull down menu](image)

Figure: 2–20 Tool Bar pull down menu

2.4.2 Customization

Besides the preconfigured Tool Bar keys additional keys may be added by a configuration dialog. To start customization press the middle trackball key inside the empty toolbar space and select Customize (see Figure: 2-21).

To remove all buttons select Reset to default.

![Tool Bar Customization activation](image)

Figure: 2–21 Tool Bar Customization activation
The customization dialog is shown (see Figure: 2-22) and buttons from the left list (available buttons) may be moved to the right list (active buttons), and buttons from the right list may be moved to the left list.

![Customization Dialog](image)

Figure: 2-22 Customization Dialog

Buttons may be moved by button control or by drag & drop operations. The following procedures are available to move a button (in all cases the Tool Bar will reflect the changes immediately):

**Button movement by button control:**

1) Move a button to the right (active) list:
   Select a position in the right list where the new button shall be inserted, select the requested button in the left list and press Add to actually move the button.

2) Move a button to the left (available) list:
   Select a button in the right list and press Remove to actually move the button.

3) Move a button inside the right (active) list:
   Select a button in the right list and press Up or Down to actually move the button one position line up or down.
4) Move all buttons to the left (available) list:
Press Reset to actually move the buttons.

**Button movement by drag & drop:**

1) Move a button to the right (active) list:
Select a button in the left list, drag & drop it to the requested position in the right list.

2) Move a button to the left (available) list:
Select a button in the right list, drag & drop it to any position within the left list.

3) Move a button inside the right (active) list:
Select a button in the right list, drag & drop it to the requested position in the right list.

**Currently available buttons which are described in more detail further down in this manual:**

1) Route Manager - Open Route Manager. Additional drop-down items (Edit/Create Primary Route, Edit/Create Secondary Route, Toggle Routes, Route Monitoring, Track Control).

2) Toggle Color Palette - Toggle color palette between Bright-Sun and Night settings. Additional drop-down items (Bright Sun Colors, Day Colors - White, Day Colors - Black, Dusk Colors, Night Colors).
3) Take Screenshot - Take an immediate screenshot. Additional drop-down items (Screenshot).

4) Draw Objects - Open Draw Objects Dialog.

5) LOP - Open Line of Position Dialog.

6) Position Fix - Open Fixed Position Dialog.

7) Exit - Exit the Application.

8) Help - Show the Help System.
2.5 CURSOR SYMBOLS

The cursors, Figure: 2-24 (below), located at the bottom left of your screen displays cursor information. The arrow on the screen is the cursor. You will use the cursor to perform most of the ECDIS’s functions including selecting menus, activating commands, and placing objects such as waypoints and markers in the display. You can move the cursor using the trackball; simply roll the ball and the cursor follows your movements.

The cursor appears as a variety of shapes and enters a variety of modes. By default, it remains in Center on Cursor mode unless a command is being performed. Depending on the command being performed, the cursor changes into one of the following shapes and enters one of the following modes. The cursor mode appears in the information panel (in the cursor box area).

- **Chart Area**: used as cursor inside the chart area
- **Target**: used to select objects in the display that you want to delete or modify
- **Menus / Dialogs**
- **Digitizer Puck (option)** this cursor symbol displays when the digitizer works with the ECDIS
- **Display Scroll down**
- **Display Scroll left**
- **Display Scroll right**
- **Display Scroll up** scroll the display 1/2 a screen in the direction the arrow is pointing
- **Zoom In**: used to draw a box around an area you want to enlarge
- **Vertical bar**
- **Change the window size**
- **Radar Cursor (A,B,C..)**

Figure: 2-24 Cursor Symbols
2.6  SHIP SYMBOLS IN THE CHART AREA

The ship symbol can be displayed as one of two symbols, a circle or a rectangular ship symbol.

This symbol adjusts to the scale of the chart.

This symbol does not adjust to the scale of the chart.

Figure: 2-25 Own Ships Symbols

2.6.1 Circle

The circular symbol is a fixed size symbol (it does not adjust to the scale of the chart). The circular symbol appears when the ECDIS is not receiving information from any navigational devices, or if the scale of the chart is such that the ship cannot be drawn in its relative size. It is also used during dead reckoning (simulation). It has a directional arrow displaying the ship's heading as well as a perpendicular shipboard line marking port and starboard sides. This arrowhead displays the expected ships position after for example 6min.

Figure: 2-26 Own Ships Symbol (Circle)

2.6.2 Rectangular Ship

The rectangular ship symbol is not a fixed size symbol and adjusts to the scale of the chart. This symbol is used at all times except when the ECDIS is not receiving navigational information or when the ship cannot be drawn to scale. It also has a directional arrow displaying the ship's heading and expected ship position after desired time.

Figure: 2-27 Own Ships Symbol (Rectangle)
2.7 INFORMATION PANEL

The ECDIS integrates information from the following shipboard sensors: GPS, ARPA Radar, Autopilot, Gyro, Echo Sounder, Speed Log, Engine RPM sensor, Rudder Position sensor, as well as optional secondary position sensors such as Loran C. The information is integrated into the information panel and graphical displays which allow the navigator to interpret the data in a single glance Figure: 2–28 shows a possible example.
Figure: 2-28  Possible example for an Information Panel with *) Route Description
<table>
<thead>
<tr>
<th>Call Out</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1.       | **Chart Name** - The name of the chart currently being displayed.  
**View Scale** - The current vertical scale of the display (in nautical miles) and the ratio between the size at which an object is displayed to its actual size.  
**Chart Scale** - The vertical scale of the chart and ratio at which the displayed chart can be viewed in order to be at scale.  
**Overlays** - Indicates the current overlay status (Base Disp for Base Display, Std Disp for Standard Display, Other Disp for Full Display) |
| 2.       | **Server Status** - Indicates the ECDIS status for Chart (Server or Client) and Route (Server or Client) |
| 3.       | **Steering Mode** - Steering mode selected from autopilot (Track Control, Heading Control)  
**Position** - Indicates the ship’s current position.  
**DGPS1** - The positioning device currently being used as well as position status information such as the number of satellites being tracked. The following is a list of abbreviations which might appear:  
a) **GP** - Global Positioning System  
b) **II** - Integrated Instrumentation  
c) **IN** - Integrated Navigation  
d) **LA** - Loran A  
e) **LC** - Loran C  
f) **OM** - Omega Navigation System  
g) **TR** - Transit Navigation System |
| 4.       | **CMG** - Course made good calculated by GPS.  
**Speed WT** - The ship’s current speed through water, displayed in knots.  
**Speed BT** - The ship’s current speed over ground, displayed in knots. |
| 5.       | **Weather Wind** - Speed and Direction over Ground (what the wind is doing if you are standing still)  
**Drift**  
**Depth** |
| 6.       | **CTS** - Course to steer |
| 7.       | **Heading Gyro** - Ship’s direction according to the gyro. |
| 8.       | **Engine RPM** - The ship’s main engine shaft or RPM |
| 9.       | **Turnrate** °/min - The ship’s current rate of turn.  
  By Heading Control, the green symbol indicates the current Turnrate.  
  By Track Control, the green symbol indicates the current Turnrate.  
  The blue symbol indicates the set Turnrate for arriving the next Waypoint. |
| 10.      | **Pri Route** - Name of the current route.  
**Sec Route** - Name of the secondary route. |
| 11.      | **Cross-track Error** - The ship’s current cross-track error in [m]. The display area shows the cross-track error in [m]eter. The center line indicates no cross-track error. A ship symbol displays the current ship position. The left red and right red marker indicates the cross-track error position. |
| 12.      | **Waypoint To** - Next waypoint no. and waypoint position  
**Track Crs.** - Display’s the current Track Course in [deg]  
**Distance** - Distance to Waypoint To in [NM]  
**Radius** - Radius  
**Time To Go** - Time to arrive at the next waypoint |
| 13.      | **Alarm window** |
| 14.      | **Rudder** - The ship’s rudder angle as a scale display. Will display two scales if your ship has a two rudder configuration. |
| 15.      | **Speed** - The ship’s current speed through water in [kts]. |
Operator Manual

<table>
<thead>
<tr>
<th>Call Out</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Waypoint Next - Track Crs.</td>
<td>Next waypoint no. and waypoint position Display's the current Track Course in [deg] from the previous waypoint to the next waypoint.</td>
</tr>
<tr>
<td>17. UTC - Local Time</td>
<td>shows the Co-ordinated Universal Time.</td>
</tr>
</tbody>
</table>

2.7.1 Operational Steering Modes of ECDIS

ECDIS may function in one of three different steering modes. The mode in which you are working is defined by the functions you are performing. In the Waypoints menu, a check mark appears next to the command name of the mode in which you are currently operating. Mode selection is made by using the Steer Manually, Steer to Track, or Steer to Course/Heading menu commands under the Waypoint menu. You may transit between modes just by selecting a different command. When you switch between modes, ECDIS displays a message box asking you to confirm the change:

![Track Control Warning Message](image)

When you switch between operational modes the following changes occur:

- Switching from Steering to Track to Course Control - The autopilot is turned off, the active waypoint is cleared, and Manual Steering appears in the information panel.

- Switching from Steer to Course/Heading to Manual Steering - The autopilot is turned off, the course line is removed, and Manual Steering appears in the information panel.
• Switching from Steering to Track to Steering to Course/Heading -
The active waypoint is cleared and ECDIS switches to Course Control until a valid heading is entered.

• Switching from Steering to Course/Heading to Steer to Track -
The course line is removed and ECDIS switches to Course Control if a valid active waypoint is selected and the data transmission between ECDIS and Autopilot is established (see Raytheon Autopilot Description NP2030, NP2035).

(1) **Steering Mode Manual Control**

Steering is done manually. ECDIS automatically switches to Manual Steering mode in the following situations:

• When you select the Steer Manually command from Steering Mode Selector Switch.

(2) **Steering Mode Track Control**

Defined by an open route with established waypoints and a turning radius. Steering may be done manually or by the autopilot. While steering to a track, the information panel will display the active and next waypoints position, distance, radius and time to go.

**The max. turn radius from e.g. WP1 to WP2 may not be larger how 135°.**

If you select the Steer to Track command while currently steering to a track, you are temporarily switched to manual steering. ECDIS is waiting for you to provide a new valid active waypoint. A valid active waypoint is defined by whether the vessel can make the required turn to enter the route at that waypoint.
Defined by an electronic heading or course over ground (course made good), rate of turn and turning radius. Steering may be done manually or by the autopilot. While steering to a course or heading, the information panel will or say “Heading Control”. When a course or heading is entered, the ship will continue following the entered course/heading for 100NM, or until a different mode of operation is selected.

If you select the Steer to Course/Heading command while you are currently steering to a course/heading, you continue steering to the original course/heading until you enter a new valid heading and select “OK”. A valid heading is defined by whether the vessel can make the physical rate of turn.
2.7.1.1 Alarm Messages

The central alarm management is managed from the SYNAPSIS INS. The system is continually monitoring ECDIS and the connected units or sensors such as Gyro, GPS, Speed Log, Radar, Nautoconning and CCRS devices and Software. When it finds a problem, it notifies you through alarms--, warnings-- and caution -- messages. These messages appear in the alarm window at the bottom of the information panel, this holds for all MFC connected to the INS. The first line indicates the alert source. Alarm messages are red, warning messages are orange, caution messages are gray.

![Figure: 2–32 Example for an Alarm Message](image)

When an alert (alarm or warning) message is triggered, the ECDIS generates an acoustic signal to notify you that a message is being displayed. The unacknowledged alert is flashing. You may either Acknowledge the message or silence the audible signal. If you Acknowledge the message, the flashing will stop. (A history of messages is kept in the 24 Hour Log. Please see "Viewing the 24 Hour Log", chapter LEERER MERKER). If more than one message is displayed you can scroll through them using the up and down arrow keys located to the right of the message. Each of the messages is numbered and the total number of alarms is displayed in the upper left hand corner. (All alarms must be Acknowledged once the situation to which it pertains is recognized or cleared.)
2.8 STATUS BAR CURSOR/CHART CENTER

The boxes, Figure: 2-33 (below), located at the bottom of the display show a variety of cursor information. The left hand corner box always displays current cursor position while the middle corner box displays distance and bearing from the ship to the cursor location as well as the estimated time of arrival at that location assuming the ship’s current speed and a direct route to that location. The right hand corner box depends on the menu command you are currently performing.

Normally the cursor box displays the center position of the chart. If you get the Route function the actual Waypoint information is indicate in this corner box. If you select the EBL/VRM function the position information changes to the corresponding position.

Figure: 2-33 Status Bar Cursor
2.9 CHART AREA

The chart area is where the ECDIS displays ship, electronic charts symbol, and past tracks. It is also where you will enter waypoints/routes, set markers, and draw lines.

The display has optional latitude/longitude grid lines which cover the entire world and are measured in degrees and minutes, with minutes expressed to the hundredth decimal.

The degrees and minutes currently in view appear down the left side and across the bottom of the display. You can control the appearance and location of the display using commands in the Display menu.

The ECDIS supports charts from government agencies (S57 and ARCS) and private chart manufacturers, like C-MAP. Please consult your dealer for the availability of charts in your area.

NOTE

All charts are displayed in a "North-up" orientation.
Datum is always WGS 1984 (World Geodetic System).

2.9.1 Chart Boundaries

While a chart is displayed, you may see red lines drawn on the display. These lines designate the different fragments of the paper charts. You may view the source of the chart; the chart name, manufacturer, date, and other information by clicking the right mouse button. When a portion of the area you are viewing is not covered by the chart currently displayed, the area appears green in color. If you are viewing an area of the globe for which you have no charts, the area appears white.
The CM93/3 Database is a seamless product. It consists of different scale layers, corresponding to as many navigational purposes of S57/3; each layer includes electronic charts with similar compilation scale, organized into a continuous coverage.

The following scale layers are defined:

<table>
<thead>
<tr>
<th>CM93/3 navigational purpose</th>
<th>Corresponding CM93/2 scale level</th>
</tr>
</thead>
<tbody>
<tr>
<td>background, large scale (*)</td>
<td>Z</td>
</tr>
<tr>
<td>background, small scale (*)</td>
<td>A</td>
</tr>
<tr>
<td>overview</td>
<td>B</td>
</tr>
<tr>
<td>general</td>
<td>C</td>
</tr>
<tr>
<td>coastal</td>
<td>D</td>
</tr>
<tr>
<td>approach</td>
<td>E</td>
</tr>
<tr>
<td>harbor</td>
<td>F</td>
</tr>
<tr>
<td>berthing</td>
<td>G</td>
</tr>
</tbody>
</table>

(*) These navigational purposes are extensions to S57/3.

Where an overlapping between two charts into the same scale layer occurs, this is resolved giving priority to one chart, according to the following criteria:

- If an ENC (Electronic Navigational Chart) data set overlaps a non-ENC data set, the ENC data set takes precedence.

- If two ENC data sets overlap, the one that was issued first takes precedence.

The other data set may remain included in the CM93/3 Database, but it is no longer regarded as an ENC, since it violates one of the fundamental principles of S57/3 (i.e. the exclusivity of data).
2.9.1.2 Track Plotter

The ECDIS positions the ship on the electronic chart using information from the GPS or other positioning sensors. The ship symbol is directional and is oriented according to your gyro heading. An optional heading vector (an arrow) and search light (the cone shape) are displayed projecting from the bow of the ship symbol.

The information panel constantly displays updated information on your position, speed, and bearing.

**NOTE**

The anti-grounding search light will detect and signal a warning if the ship is about to cross a safety contour area. The length of the heading vector determines the length of the search light, hence the ship’s warning time. (A general ship alarm will sound if the warning is not acknowledged within 30 seconds).
2.9.2 Changing Display Colors

Changing Display Colors in a Single ECDIS System see chapter 6.1.8.

Changing Display Colors in a Double ECDIS System.
In this case the system synchronized the display color schemes in addition to the common brightness dimming with the second ECDIS System.
3 MAIN MENU

3.1 MAIN MENU COMMANDS

If your ECDIS system is connected to a printer, you can print the display image. You should note that although the system keeps tracking the ship and processing all other sensor inputs, you cannot interact with ECDIS while printing takes place. The Main menu contains the following commands, Figure: 3-1.

Table 3-1 Overview Main Menu

<table>
<thead>
<tr>
<th>Main Commands</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1.1 Print Setup</td>
<td>Allows you to select and configure a printer.</td>
</tr>
<tr>
<td>3.1.2 Print</td>
<td>Allows you to print the image.</td>
</tr>
<tr>
<td>3.1.3 Screenshot</td>
<td>Allows you to create and manage screenshots.</td>
</tr>
<tr>
<td>3.1.4 Exit</td>
<td>Ends your session in the ECDIS.</td>
</tr>
</tbody>
</table>
3.1.1 Printer Setup

The Print Setup command enables you to select and configure your printer.

**NOTE**
When printing, ECDIS automatically reverses a black background to white.

**Procedure:**
Step 1 Select a Printer from the drop-down list
Step 2 Select either a portrait or landscape paper orientation
Step 3 Click on OK

![Print Setup Dialog Box](image)

Figure: 3–2 Print Setup Dialog Box

3.1.2 Print

**Procedure:**
Step 1 To print the plotting area with heading labels, click in a check box to choose the type of heading labels you desire
Step 2 You may turn off the printing of the information panel and toolbar by removing them from the display using the Display menu commands.
Step 3 Click on Print.
3.1.3 Screenshot

NOTE
This Function is only available on system with USB support, because due to the size of the files the screenshots may only be exported to a USB storage.

Within this dialog, functions for the creating and the management of screenshots are provided.

Create new Screenshot
For the creation of a screenshot the following options may be selected:
- An alphanumerical File Name Prefix
- The scale of the screenshot (100% to 25% in 4 steps)
- A delay of up to 10 seconds
  The delay time may be useful to capture menus or popup windows.
  If a delay is set the Screenshot window will be hidden during the whole delay time
- The mode for the screenshot (Screen or Chart Window)
Procedure:

Step 1  Click on Create new Screenshot
Step 1  Click on Capture.

The Screenshot window will automatically be hidden while the screenshot is generated. Any other windows which are on top of the chart will be captured in the screenshot.

Figure: 3–4  Create new Screenshot

Manage Screenshot
The Screenshots are saved as BMP files. The File names are generated automatically form the given prefix, current date and time and the options. The maximum number of screenshots, which may be stored in the system, is 100.

For the management of the stored screenshot select the appropriate tab.

Procedure:

Step 1  Click Manage Screenshot.
Step 2  By double clicking on a listed screenshot a preview will be displayed.
Step 3  Selected screenshots may be Exported to an USB storage.
       Selected screenshots may be Deleted.
3.1.4 **Exit**

**NOTE**

Do not exit from ECDIS by turning off the computer. This may cause to loose plot data or may damage your system!

**Procedure:**

Step 1  Select the Exit command.
Step 2  Click Yes command.

Figure: 3–5  Manage Screenshot

Figure: 3–6  Utilities Menu
4 CHART MENU

4.1 CHART MENU COMMANDS

This menu is used for the chart management with following process functions:
- Chart Info and Selection
- Init the digitizer functions (option)
- Chart License, Installation and Updates
(Annex-3 Charts)

<table>
<thead>
<tr>
<th>Main</th>
<th>Charts</th>
<th>S57 Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Goto ARCS Chart</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Info / Select...</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S57 + CM93/3 Chart Catalog</td>
<td></td>
</tr>
<tr>
<td></td>
<td>License</td>
<td>▶</td>
</tr>
<tr>
<td></td>
<td>Installation</td>
<td>▶</td>
</tr>
<tr>
<td></td>
<td>Updates</td>
<td>▶</td>
</tr>
</tbody>
</table>

Figure: 4-1 Chart Menu

Table 4-2 Overview Chart Menu

<table>
<thead>
<tr>
<th>Charts Commands</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2 Goto ARCS or Goto S57</td>
<td>Toggles between ARCS and S57.</td>
</tr>
<tr>
<td>4.3 Info/Select...</td>
<td>Allows you to select and view the different charts you have available for the world or the currently displayed region.</td>
</tr>
<tr>
<td>4.3.1 S57 + CM93/3 ARCS</td>
<td></td>
</tr>
<tr>
<td>4.3.3 S57 + CM93/3 Chart Catalog</td>
<td>Allows you to view and verify the installed charts.</td>
</tr>
<tr>
<td>4.4 CM93/3...</td>
<td>License Administration</td>
</tr>
<tr>
<td>4.5 IHO S63...</td>
<td></td>
</tr>
<tr>
<td>4.6 ARCS...</td>
<td></td>
</tr>
<tr>
<td>4.7 CM93/3 or IHO S63 ARCS</td>
<td>Installation</td>
</tr>
</tbody>
</table>
### Charts Commands

<table>
<thead>
<tr>
<th>Charts Commands</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.9 S57 and CM93/3</td>
<td>Updates</td>
</tr>
<tr>
<td>4.10 ARCS</td>
<td></td>
</tr>
<tr>
<td>4.11 Chart Server Rights</td>
<td>Allows you to take over the “Chart Server Rights”. Chart Server Rights... (this command indicates the ECDIS status client)</td>
</tr>
</tbody>
</table>
4.2 GOTO ARCS OR GOTO S57

If the two chart types are stored on the ECDIS.

Procedure:
Step 1  Select Goto ARSC Chart or Goto S57 Chart

Result:
The ECDIS switch over to ARCS chart and inversely to S57 chart.
4.3  INFO / SELECT

Allows you to select and view the different charts you have available for the world or the currently displayed region.

4.3.1  Info / Select - S57 + CM93/3 - Chart Type

Info about S57 and CM93/3 Chart Type
The C-MAP 93/3 Database is a seamless product. It consist of different scale layers, corresponding to as many navigational purposes of S57 and 93/3; each layer includes electronic charts with similar compilation scale, organized into a continuous coverage. The following scale layers are defined:

(1) Background, small scale
(2) Background, medium scale
(3) Overview
(4) General
(5) Coastal
(6) Approach
(7) Harbor
(8) Berthing

Where an overlapping between two charts into the same scale layer occurs, this is resolved giving priority to one chart, according to the following criteria:

If an ENC data set overlaps a non-ENC data set, the ENC data set takes precedence.

If two ENC data sets overlaps with each other, the one that was issued latest takes precedence. The other data set may remain included in the S57 Database, but it is no longer regarded as an ENC, since it violates one of the fundamental principles S57 (i.e. the exclusivity of data).
Procedure: (Figure: 4–2)

Step 1  Select Charts (menu bar)
Step 2  Select Info / Select.. The Dialog Box appears
Step 3  Select S57 + CM93/3
Step 4  Point and click on the different chart types (i.e., Harbor, Coastal, etc.).
        In order to see all of your charts, you may need to first click on the World
        Chart and click “View.” Red boxes with hatch marks appears in the
        display, and on top of the chart to indicate chart coverage with C-MAP
        charts. Official S57 ENCs are marked in green.
Step 5  Point and click on the chart you wish to view (inside the hatched box).
        You may need to zoom-in, in order to see the individual charts.

NOTE
You may receive a message which states “Please center on a region
covered by this chart.” In this case, click on “OK,” then point and click the
cursor on an area of the chart you wish to view.

Step 6  Click on View to view the chart and leave the dialog box open or
        Click on View and Close to view the chart and close the dialog box

NOTE
If the chart you selected does not cover 80 % of the display at the charts
designated scale, the program will override your choice and display a
more appropriate chart. You may override this by zooming in the display
until your chart is displayed.
Figure: 4-2  Select Chart Dialog Box -S57 + CM93/3-

Command Buttons:

- **View**
  - Click on View to view the chart and leave the dialog box open.

- **View and Close**
  - Click on View and Close to view the chart and close the dialog box.
4.3.2 Info / Select - ARCS - Chart Type

Info about ARCS Chart Type
ARCS means Admiralty Raster Chart Service. This institution scans seacharts of the British Admiralty (BA) in a raster-data-format. Such a manner scanned seacharts are available on CD-ROM as Raster Nautical Charts (RNCs) with a worldwide coverage.
A periodical update-service of the ARCS -seacharts is ensured by the manufacturer.
A seachart in raster-data-format is divided into pixels and then stored. On the screen of the ECDIS these pixels will be displayed.
In this way the complete (paper-) chart equivalent is displayed on the screen. As additional information only the geographically coordinates are displayed (after selection by courser) on the Information Panel.
Other, for seacharts typically information, as there are buoys, light beacons, wrecks or depth information can only be read out of the displayed seachart. There is no object query possible on Raster charts.
Procedure:

Step 1  Select Charts (menu bar)
Step 2  Select Info / Select... The Dialog Box appears
Step 3  Select ARCS

Figure: 4-3  Select Chart Dialog Box –ARCS–
**ARCS Selection:**

- **All installed charts**
  - Shows all installed charts in the List Box

- **Select by chart name**
  - Select chart by name.
    
    Example: Type in the name of selected sea-area, for example “oslo”.
    In the List Box all ARCS charts already installed having “oslo” including in their name are listed in the box.
    Set a double click onto the respective chart.

- **Last used charts**
  - The last used charts listed in the box.

- **Select by Position**
  - Select by Position.
    In this case position coordinates (longitude/latitude) can be input either manually or directly by cursor positioning.

  **Manual Inputs:**
  Editing the requested coordinates respective seachart will be loaded and displayed.
  Click on “View and Close” button.

  **By Cursor Position:**
  Set the cursor on this sea-area for which the ARCS chart is to be loaded.
  Click on “View and Close” button.
  The selected chart is loaded and displayed.

  **By Ship Position:**
  Click on the “Ship Pos” button.
  The respective ARCS chart (according to ship position) will be loaded.
Command Buttons:

- **View**: Click on View to view the chart and leave the dialog box open.
- **View and Close**: Click on View and Close to view the chart and close the dialog box.
4.3.3 S57 and CM93/3 Chart Catalog

This menu function allows you to view and verify the S57 and CM93/3 charts.

Procedure: (Figure: 4-4)

Step 1 Select the Database, e.g. DE. The left list box displays the cell names of the Database DE.

Step 2 Select a cell name, the cell information appears

Step 3 Select Goto Cell in order to center the selected cell on the display

Step 4 By selecting the check box the cell boundary is highlighted

Figure: 4-4 S57 and CM93/3 Chart Catalog dialog boxes

Command Buttons:

Verify Update Status  Click on Verify Update Status for verifying the cells.

After this process, the left list box displays the cells update status of the selected database.

If the Update Status of a Database cannot be verified the following dialog box displays.
Figure: 4-5  Update Status of a Database

Export List  Click on Export List to save the content of the left list box as a text file on a USB-stick.

Figure: 4-6  Export List

If no disk is available
**Goto Cell**  Click on Goto Cell in order to center the displayed chart the selected cell.

**Close**  Click on Close for closing this window.
4.4 LICENSE ADMINISTRATION FOR CM93/3 LICENSES

(see Annex-6 Charts S57 License)

CM93/3 Description
93/3 licences for 93/3 charts are obtained from C-MAP Norway AS and are available for Worldwide Coverage, one or more Zones, one or more Areas, or single charts.

Licenses can only be used on the system for which they were generated and cannot be transferred to other software or hardware systems. Licenses can be added manually or automatically. To add a license manually simply choose the data set or area name on the right side of this box and type the corresponding license string into the appropriate box.

The user has the option of subscribing to or purchasing licenses:

- In case of subscription, licenses are valid for 12 months from the moment in which they are registered in the system (see below). The subscription fee includes the update service performed through the CM93/3 Distribution Center, plus two issues of the CD-ROM, that will be sent to the user after four and eight months.

Subscriptions are automatically renewed and invoiced after the first year and every subsequent year; C-MAP must be notified in writing of subscription termination, at least three months before the renewal date.

- In case of purchase, licenses are valid on a permanent basis (i.e. they never expire). Updating is not included.
4.4.1 **Add License manually**

Add License manually allows a license to be entered manually.

**Procedure:** (Figure: 4-7)

Step 1  Select Charts (menu bar).
Step 2  Select CM93/3 License... The Dialog Box appears.
Step 3  Select Add license manually.
Step 4  Enter the License key (16 characters) via OSK
Step 5  The procedure must be confirmed via the Add license key
Step 6  Select a Zone or a Zone Area.

The Zone or the Areas are released and shown on the Chart Reader.

![Add License manually procedure](image)

Figure: 4-7  C-MAP93/3 License Administration box Add License manually selected
4.4.2 Expired Licenses

Expired Licenses lists all C-MAP Licenses that will expire by a certain date in the future.

**Procedure:** (Figure: 4-8)

1. Step 1 and Step 2 (Figure: 4-7)
2. Step 3 Select Expired licenses.
3. Step 4 Enter the desired date with the format Month.Year via OSK
4. Step 5 Select Create, all known Zones and Areas are displayed

![License Administration](image)

Figure: 4-8  C-MAP 93/3 License Administrationbox Expired licenses selected
4.4.3 Licenses List

Within this administration application, all the licenses that are still valid are listed and displayed with the following information.

- valid to (e.g. 10-2002)
- Zone/Area
- 16 character license code

Procedure: (Figure: 4-9)

Step 1 and Step 2 (Figure: 4-7)
Step 3 Select License list. All the licenses that are still valid are listed and displayed with the following information.

Figure: 4-9 C-MAP93/3 License Administrations Licenses list selected
4.4.4 License order per position

This function enables sea areas to be chosen by cursor action across areas.

Procedure: (Figure: 4-10)

Step 1 and Step 2 (Figure: 4-7)

Step 3 Select Order per position by using the Trackball (mouse)
To select the desired area, at least three coordinates must be set by action. The position data of the coordinates are entered in the list box Coordinates per mouse click in order.

Step 4 After a final calculation, licenses can be ordered for this area using C-MAP.

Step 5 Displays a selected Zone/Area from the Chart collection area.
In this case, the entire chart area is displayed in a reduced scale, the Zone/Area is overlaid as a red grid pattern

Figure: 4-10 CM93/3 License Administrationbox Order per position selected
**Command buttons** in the Coordinates per mouse click **area**

- **Delete list item** allows a cursor position to be deleted.
- **Clear list** deletes all entries from the list.
- **All Zone Area Portfolios** specifies the licensing extent for the chart type in which the selected area is located. The selection is made via the softbutton of the Box.
- **Calculate** starts the compilation of the charts that were recorded via the positions of the coordinates. In this process, the default chart type is taken into account.

**Command buttons** in the Chart collection **area**

The result of the calculation is displayed in this List Box. In this connection the Zone is displayed with the affected Areas.

- **Delete list item** allows a selected Zone or an Area to be deleted from the List Box Chart collection.
- **Clear view** deletes the license chart displayed and the displayed charts of the chart collection.
- **Save list to file** created a license file with the contents of the List Box Chart collection on the target drive (USB-Stick or CD/DVD drive). After pressing the button, the following window appears.
This window displays the imminent data transfer to the target directory a: and the name of the license file (e.g. RaytheonAnschütz...).

Step 1  The action is executed by pressing the Yes key.
Send this file via Email to the chart manufacturer C-MAP.

If you click on No, the License Administration box appears again.
4.4.5 License order per route

In this connection, the license selection is made via a route that has already been planned. For example, the route was planned on an ARCS chart and should be run over a CM93/3 chart. The desired route is projected to the exact position in the CM93/3 background chart upon selection. In this process, the license folder is determined by the chart type assignment.

Procedure: (Figure: 4-11)

Step 1 and Step 2 (Figure: 4-7)
Step 3 Select Order per position by using the Trackball (mouse)
Step 4 Select the route name from Select route from list:
Step 5 Displays a selected Zone/Area from the Chart collection for selected route area. In this case, the entire chart area is displayed in a reduced scale, the Zone/Area is overlaid as a red grid pattern.

Figure: 4-11 CM93/3 License Administrationbox Order per route selected
Command buttons in Select route from list: area

All known routes are displayed in this List Box. The first route is automatically proposed as the default route. The route selection is made via the cursor or via the scroll bar.

specifies the licensing extent for the chart type through which the route runs.

starts the compilation of the charts that were recorded via the route. In this process, the default chart type is taken into account.

Command buttons Chart collection for selected route area

The calculated charts are listed within this List Box

allows a selected Zone or an Area to be deleted

deletes the license chart displayed

created a license file with the contents of the List Box Chart collection on the target drive (USB-Stick or CD/DVD drive).

After pressing the button, the following window appears.
This window displays the imminent file transfer to the target directory a: and the name of the license file (e.g. Raytheon Anschütz...).

Step 1  The action is executed by pressing the Yes key.
Send this file via Email to the chart manufacturer C-MAP.

If you click on No, the License Administration box appears again.
4.4.6  Add license from file

This function reads the C-MAP license key for the requested area into the ECDIS System.
The license files are distributed CD via C-MAP. The license files are automatically included in the C-MAP data structure and release the desired areas for a limited period.

Procedure: (Figure: 4-12)

Step 1 and Step 2 (Figure: 4-7)
Step 3  Select Add license from file by using the Trackball (mouse)  
Insert the relevant medium into the appropriate drive.
Step 4  Open the directory structure of the ECDIS computer with the cursor. a:\.PASSWORD.USR  click on this directory entry if there is a CD. (?:\ the letter for the partition has not been specified)

Figure: 4-12 CM93/3 License Administrationbox Add license from file selected
Command button

**Add licenses**

Within the List Box License file list: all licenses are overlaid when the key is pressed. At the same time, the licenses are processed within the program. The desired areas are released.
4.4.7 Select License order manually

Within this function a chart list, comprising different Zones and Areas can be merged together and transferred to C-MAP as a license order. Selected Areas of a Zone (e.g. 3) are removed from the License order list when the entire Zone (3) is selected.

Procedure: (Figure: 4-13)

Step 1 and Step 2 (Figure: 4-7)
Step 3 Select Order manually.
Step 4 Select a e.g. Zone 1, Area 3

License Zone/Areas displays all possible C-MAP Zones/Areas.
The selection is made with the scroll bar and cursor function

License order list displays the selected Zones/Areas within a list.
Command button

- **Add to list**: inserts the selected Zone/Areas from the List Box. Action can also be executed by clicking the desired Zones/Areas with the cursor.

- **Remove from list**: deletes the selected names from the List Box.
  - Deletes all entries from the List Box in sequence.

- **Clear list**: deletes all entries from the List Box.

- **Create**: creates a license file from the List Box.

The following window appears when the key is pressed.

![License Administration Window](image)

**Step 1**  
The action is executed via Yes.  
Send this file via Email to the chart manufacturer C-MAP.

If you click on No, the “License Administration” box appears again.
4.5 License Administration for IHO S63..... License

(see Annex-6.1 Charts IHO S-63)

4.5.1 User Permit

Procedure: (Figure: 4-14)

Step 1 Select Chart (menu bar).
Step 2 Select IHO S63 License....
Step 3 Select User Permit.

The Registration No. is indicated in the field

Figure: 4-14 License dialog box, User Permit selected
4.5.2 Licenses list

**Procedure:** (Figure: 4-15)

Step 1 and Step 2 (Figure: 4-14)
Step 3 Select Licenses list.

Licenses can be renewed and the status of the current license list reviewed

![License dialog box](image)

**Command Buttons:**
- **Delete selected License**
- **Delete expired License**
- **Delete all Licenses**

Figure: 4-15 License dialog box, Licenses list selected
4.5.3  Add Licenses from file

**Procedure**: (Figure: 4-16)

Step 1 and Step 2 (Figure: 4-14)
Step 3  Select Add Licenses from file.

Licenses can be added automatically by choosing Add licenses from file and pointing to the ENC.PMT file received from IHO S63.

All the licenses contained within this file will be automatically registered.

![Image of IHO S63 License Administration dialog box]

Figure: 4-16 License dialog box, Licenses list selected
4.5.4 **Product List**

**Procedure:** (Figure: 4-17)

Step 1 and Step 2 (Figure: 4-14)

Step 3  Select Product list.

The product list shows all available IHO S63 charts.

If you want to order a new license please note the Cell code and contact IHO S63 Service.

Figure: 4–17 License dialog box, Product list selected
4.5.5 Import Product list

If you got a CD or data set via Email with updates or new chart cells IHO S63 include a second data file with a new product list.

Procedure: (Figure: 4-18)

Step 1 and Step 2 (Figure: 4-14)
Step 3 Select Import Product list.
   The new product list overwrites the old one.
   (The old product list cannot be rewritten from an older CD version)

Figure: 4-18 License dialog box, “Import Product list” selected
4.6 LICENSE ADMINISTRATION FOR ARCS LICENSE

Procedure: (Figure: 4-19)

Step 1 Select Chart (menu bar).
Step 2 Select ARCS License....
Step 3 If you have no Security Key (software dongle) loaded before the License Administrator dialog box appears at first. Follow the text items in the dialog box.
Step 4 Start the identification check.

Figure: 4-19 ARCS Permit List dialog box selected
Command Buttons:

License Info
Shows the License Information.
In this case the user permit (data file) can be copied automatically on a USB-Stick, CD/DVD.

![Image of ARCS License Information]

Figure: 4-20 ARCS License Information

Load Permit file
Select this button when you get a new License or an License Update per USB-Stick, CD/DVD.

![Image of Load Permit file]

Figure: 4-21 Load Permit file
Add Permit

Select this button when you get a new License or a License Update per phone or fax.

Figure: 4-22 Add Permit
Remove Permit
Select the relevant chart before and click on the Remove Permit button.

Practice: If you got a license update, sometime a chart permit cancelled and replaced by another chart number.
Read SCHEDULE A AMENDMENT-CHART SUPPLY DETAILS from the ADMIRALTY RASTER CHART SERVICE.

---

Remove All
Select this function to remove all charts.
4.7 CM93/3 or IHO S63 Installation....

(see Annex 6.2 and 6.3 Installation S57 ... ARCS)
The electronic charts belonging to the two most general “navigational purposes”
(i.e. the so-called background charts) are stored on the C-MAP 93/3 Database
CD-ROM in non-encrypted form, meaning that can be freely accessed and
displayed on the ECDIS, before the user actually buys licenses for the charts.
All other charts are stored on the CD-ROM in encrypted in S57 format, meaning
that the user has to buy licenses to access and display them.
Each license corresponding to one electronic chart.

Procedure: (Figure: 4-25)

Step 1 Select Charts (menu bar)
Step 2 Select Installation
Step 3 Select S57 and CM93/3 Installation
Step 4 Select Install CM93/3 Database

To install a database, place CD into the CD/DVD drive and press the
Install Database button. The installation will be take 3 to 5 minutes.
If no CD is available a dialog box appears, follow the text item or Cancel
this function.
Figure: 4–25 “S57 Installation....” dialog box selected
The process by which the user chooses which chart he wants to access (i.e. which licenses he needs to buy) is called Install Database. To install a database, place CD into the CD/DVD drive and press the Install Database button. The installation will take 3 to 5 minutes. If no CD is available a dialog box appears, follow the text item or Cancel this function.

Dialog Box Area:

Administration

In the Administration area you can see available charts. The “✓” symbol indicates the selected charts.

Dialog Box Area:

Priority

If you want to modify the layer priority, select the chart you will have displayed first or last and click Priority “Up” or “Down”.

Remove Database

To remove a selected database, click on “Remove Database”. Before the program deletes the selected database a dialog box appears with the question Are you sure......
Dialog Box Area:

**Import and Convert S57 data**

- **Apply** executes an action
- **Exit** the dialogue box is faded out
- **Cancel** a current procedure is aborted

Import and Convert unencrypted S57 data files.

Insert the data CD into the CD/DVD drive and select Import unencrypted.

The following dialog will be displayed. Select the CD drive and the directory where the S57 data is stored.

Figure: 4-26 Import unencrypted data file
There are two options to select cells from CD

Automatic selection or manual selection.

**Automatic selection**
In this case the program recognizes and selects all cells in a selected directory (sub directories included). These cells will be imported.

**Procedure:** (Figure: 4-27)

Step 1, Step 2, Step 3 (Figure: 4-25).
Step 4 Select the folder S57 (e.g. US).
Selective the chart directory (e.g. US, step1) containing the datafile you wish to convert.
Step 5 Select Check For Cells.

Figure: 4-27 Automatic selection
Manual selection
In this case only the manually selected cells will be imported (without sub directories).

Procedure: (Figure: 4-28)

Step 1, Step 2, Step 3 (Figure: 4-25).
Step 4 Select the folder S57 (e.g. US).
Step 5 Select the chart directory containing the datafile you wish to convert.

Figure: 4-28 Manual selection
• Starting the conversion process

Procedure: (Figure: 4-29)

Step 1  Select the Execute button
The dialog box File conversion in progress appears and shows the processing.

Figure: 4-29 Conversion display
The conversion process ends with following dialog box (Figure: 4-30).

**Step 1** Select OK.

![Import of data completed](image)

**Figure: 4-30 Import of data completed**

If you want to see the complete installation information, then select View Log (Step 2). The following dialog window appears.

![Compilation log dialog box](image)

**Figure: 4-31 Compilation log dialog box**

**Note**

If the following message appears:

Following cells were not installed:

XXXXXXXXXX

That means:
The chart is invalid, contact the chart manufacturer and state to the cell identifier.

For a detailed error information about a cell in the summary list, please select the cell (step1).
Insert the data CD into the CD/DVD drive and select Import IHO S-63. The following dialog will be displayed. Select the CD drive and the directory where the S57 data is stored.

Figure: 4–32 Import data file
There are two options to select cells from CD

Automatic selection or manual selection

Automatic selection
In this case the program recognizes and selects all cells in a selected directory and subdirectories.
These cells will be imported.

Procedure: (Figure: 4-33)

Step 1, Step 2, Step 3 (Figure: 4-25).
Step 4 Select the folder S57 (e.g. US).
Select the chart directory (e.g. US, step1) containing the data file you wish to convert.
Step 5 Select Check For Cells.

Figure: 4–33 Automatic selection
Manual selection
In this case only the manually selected cells will be imported (without subdirectories).

Procedure: (Figure: 4-34)

Step 1, Step 2, Step 3 (Figure: 4-25).
Step 4  Select the cell folder containing the data file you wish to convert. Normally, the sub directory number is 0.
• Starting the conversion process

Procedure: (Figure: 4-35)

Step 1 Select the Execute button
The dialog box File conversion in progress appears and shows the processing.

Figure: 4-35 Conversion display
The conversion process ends with following dialog box (Figure: 4-36).

Step 1  Select OK.

![Image](image.png)

Figure: 4-36 Import of data completed

If you want to see the complete installation information, then select View Log (Step 2). The following dialog window appears.

![Image](image.png)

Note

If the following message appears:

Following cells were not installed:

XXXXXXXXXX

That means:
The chart is invalid, contact the chart manufacturer and state to the cell identifier.

For a detailed error information about a cell in the summary list, please select the cell (step1).

![Image](image.png)

Figure: 4-37 Compilation log dialog box
4.8 ARCS Installation

(see Annex-6.3 S57.. ARCS Charts Installation)

Procedure: (Figure: 4-38)

Step 1 Select Charts (menu bar)
Step 2 Select Installation
Step 3 Select ARCS Installation. The volume list shows already installed zones.
   Place an ARCS chart CD into the CD/DVD drive.

Figure: 4-38 ARCS Installation
Install Volume
Click on the button, the installation process starts

Figure: 4–39  ARCS Installation process

Recommendation
If available, the provided Update should be installed now. The update process is also initiated by clicking on the Install Volume button (chapter 4.10).

Remove Volume
Click on this button if you want to remove the selected volume.

View ARCS Zones
Click on this button to view the ARCS zones.

Figure: 4–40  ARCS Zones

Exit
Click on this button when you want to stop the process.
4.9 S57 and CM93/3 Updates

(see Annex-7 Charts Update S57.. ARCS)

Procedure: (Figure: 4-41)

Step 1 Select Charts (menu bar).
Step 2 Select S57 Updates. The Dialog Box appears.
Step 3 Select the chart type

Figure: 4-41 Auto Updating data dialog box
Command Buttons:

**Auto Updating**

Auto Updating is only supported for C-MAP databases. Auto Updating presents three download procedures.

**Load All**

Will load and install all available updates for the licensed areas from the C-MAP server directly.

**Get Size**

Will check the size of the available update for the licensed areas.

**Get List**

Will get the list of available updates from the C-MAP server.

**Load Selected**

Will load and install only the selected charts from the list. The list has to be filled by the function Get List before.

**Create Order**

Insert a disk into the selected drive and select Create Order. An order file will be written on the disk. The name of the order file is the name of the database with the extension .ord (e.g.: World.ord).

Take the disk with the order file to a system with Email capabilities and send the order file as an attachment to the C-MAP update server updates@c-map.no.

You will receive an automatic answer with one or more sequentially named answer files with the extension.

Save these attachments to the and take the USB-Stick back to the Processor.

**Process Answer**

Select the soft button to install the updates. Please ensure that all update answers are processed. The sequence in which the answers are processed doesn’t matter.
The user can check the updates and then expand the update on the various objects in the chart. The chart will automatically pan and highlight the location of the object as shown below.

**SemAuto Updating**

Used for S57 charts.

Click on the SemiAuto Updating, the following dialog box appears. In this context the update will be done by USB- Stick or CD ROM disk.

Insert the disk into corresponding drive.
Select the disk icon in the dialog box by cursor.
Open the following folders, look for corresponding name and the version no. indicated on the right side of the dialog box.

Figure: 4-42 SemiAuto Updating dialog box

Click on Start (see step 1).
The dialog box is displayed as shown above. The compilation process is started (Figure: 4-42).

If the updating process is completed the dialog box is switched back to its previous state.
Clicking on the “Review Updates”, the following dialog box appears. Now you can review the updates applied listed by Auto Updating or by Semi Auto Updating.

Inside the Update Log window all updates are listed and stored with their name, actual status, update version number and transfer date. With an update of a zone, all previous area related data of this zone are erased.

Inside a Review window all applied updates are displayed relative to their designated folders. The designation of the version-number has been changed by this process. Example: GBX01SW.002 changed into GBX01SW.C02 (C means compiled)

For detailed information of an update, the respective folder has to be selected via cursor. With a double click ([Right] button) the change-history is displayed. To display a special change (example: WRECK), this input has to be activated by a double click. To do this, the respective chart is displayed and the selected change (example WRECK) is highlighted by a flashing circle.
Figure: 4-43 Updating Log Review Updates
4.10 ARCS Update

(see Annex-7 S57.. ARCS)

Procedure: (Figure: 4-44)

Step 1 Select Charts (menu bar).
Step 2 Select Updates.
Step 3 Select ARCS Updates. The volume list shows already installed zones.
Place an ARCS chart CD into the CD/DVD drive.

![Figure: 4-44 ARCS Installation and Update]
Install Volume  
Click on the button, the installation process starts (Figure: 4-45). The ECDIS system checks the update edition. If the edition is older than the actual ECDIS edition the following window appears.

Figure: 4-45 ARCS update

Exit  
Click on this button when you want to stop the process.
4.10.1 ARCS Updates indication

ARCS updates can be displayed directly via the chart concerned or via the Info/Select function.

ARCS Updates within a chart

Within an ARCS chart all updates are entered and selected automatically. To display the updates the functions ARCS Show Updates and ARCS Indicate Updates should be selected with the cursor.

Figure: 4-47 Showing ARCS Updates in the chart

Show Updates with this function the updates are overlaid in the chart area. By toggling this function, the update information can be detected.

Indicate Updates highlight the update area with red rectangle.
ARCS Updates within the Info/Select. Dialogs

Procedure: (Figure: 4−48)

Step 1  Select Info / Select...
Step 2  Select ARCS

Figure: 4−48  Info/Select... dialog box with update information
4.11 Chart Server Rights

This functionality is only possible in connection with a navigation system containing at least two ECDIS units. Depending on the system configuration, one ECDIS can be given Server or Client status.

Chart Server Rights means:

Central sea chart management via one ECDIS. The Chart Server feeds all ECDIS units with the same sea chart information (Installation and Updates).

Client means:

The sea chart can only be preset by installing the Chart Server Rights accordingly. The following display information “Chart Client *” indicates the data transfer between Chart Server and Client.

License:

The Chart License is to be entered on each unit independent of the ECDIS status (Chart Server Rights or Client).

Select Chart Server Rights:

Incorporated in a navigation system, one ECDIS can adopt the status “Chart Server”. The change-over becomes effective immediately unless the current ECDIS (“Chart Server”) is loading new charts.
the ECDIS with Chart Server Rights is in progress. The switching over task is not possible.

Figure: 4-49  Chart Server select
5 OPTIONS MENU

This menu is used to select special chart display adjustments for the selected chart type (chart type selection chapter 4.3). These adjustments are regulated by the chart type.

5.1 OPTIONS MENU ARCS

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<td>Open a dialog box with actual chart information (Chart name, Paper Chart Issued, update information).</td>
</tr>
<tr>
<td>5.1.2 View Chart Notes....</td>
<td>Show the Chart Legend.</td>
</tr>
<tr>
<td>5.1.3 Notices to Mariners</td>
<td>If available.</td>
</tr>
<tr>
<td>General Notices to Mariners</td>
<td>If available.</td>
</tr>
<tr>
<td>Chart Warnings...</td>
<td>If available.</td>
</tr>
<tr>
<td>5.1.4 Show Updates</td>
<td>Shows update history.</td>
</tr>
<tr>
<td>5.1.4 Indicate Updates</td>
<td>Shows updated chart zones highlighted by red lines (square).</td>
</tr>
</tbody>
</table>
5.1.1 Chart Information

ARCS Chart information shows all chart specific information generated by the ARCS chart manufacturer at digitalization of the chart.

Procedure: (Figure: 5-2)

Step 1 Select ARCS Option (Figure: 5-1)
Step 2 Select Chart Information... The Dialog Box appears

5.1.2 View Chart Notes

Within this menu, ARCS chart notes of the currently loaded chart can be selected and displayed. The chart notes are managed via a tree-like icon directory.

Procedure: (Figure: 5-3)

Step 1 Select ARCS Option (Figure: 5-1)
Step 2 Select View Chart Notes. The Dialog Box appears
5.1.3 Notices to Mariners.. and Warnings

Within these menu entries special marine or warning messages can be called up which can be read in the dialogue box.

If there are no marine or warning messages available for the currently loaded ARCS chart, these menu items are automatically deactivated.

The corresponding text line within the ARCS option menu is then displayed in grey.

5.1.4 Show Updates and ARCS Indicate Updates

Chart updates always refer to a complete chart.

In order to get an over view about all official updates as quickly as possible, the entire chart display should be zoomed up.

On calling up the menu item ARCS Indicate Update, updated chart zones are displayed highlighted by in red lines (square).

For a closer view of these zones the cursor is to be positioned in one of these squares.

By double-clicking the [Left] button at the trackball the square is zoomed up.

To identify the updates within the square unambiguously, the menu item ARCS Show Updates should be called up repeatedly.

With every calling of this menu item the updates are faded in or out.
5.2 OPTIONS MENU FOR S57

The option menu contains the following commands:

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<td>Select from Presentation Libraries for S52 and C-Map or Chart 1 including color differentiation diagram.</td>
</tr>
<tr>
<td>5.2.2 Add/Delete Mariner’s Objects.....</td>
<td>Add or delete chart symbols, points, lines and text.</td>
</tr>
<tr>
<td>5.2.3 Manual Updates.....</td>
<td>Add or delete chart data to or from a chart according to S57, Collars and Symbols.</td>
</tr>
<tr>
<td>5.2.4 Legend......</td>
<td>Shows the Chart Legend.</td>
</tr>
<tr>
<td>5.2.5 View Update/ Log</td>
<td>Shows update history (manual update and marine’s objects).</td>
</tr>
<tr>
<td>5.2.6 Overlays</td>
<td>Select different display modes:</td>
</tr>
<tr>
<td></td>
<td>- Base Display</td>
</tr>
<tr>
<td></td>
<td>- Standard Display</td>
</tr>
<tr>
<td></td>
<td>- Full Display</td>
</tr>
<tr>
<td></td>
<td>- User defined Display</td>
</tr>
<tr>
<td></td>
<td>- Options...</td>
</tr>
<tr>
<td>5.2.7 CM93/3 Chart Scale</td>
<td>Set the CM93/3 chart scale mechanism:</td>
</tr>
<tr>
<td></td>
<td>- automatic size (-Normal,-Medium,-High), switching to appropriate navigation purpose while zooming</td>
</tr>
<tr>
<td></td>
<td>- A–G, Z zooming on one defined navigation purpose (e.g. harbor)</td>
</tr>
</tbody>
</table>

Figure: 5-4 S57 Options Menu
### Options Commands

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<th>S57 and 93/3 Options Commands</th>
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<td>5.2.8 Symbol Type</td>
<td>Change symbol type from simplified symbol to traditional symbols or the other way.</td>
</tr>
<tr>
<td>5.2.9 Presentation Date</td>
<td>For the presentation of the dependant chart objects.</td>
</tr>
</tbody>
</table>
5.2.1 Presentation Library

With this menu item, the user can select from different presentations for the currently loaded chart S57.
In accordance with IHO-52 “Specifications of Chart Content and Display Aspects of ECDIS” colors and symbol, this menu is comprising Test Presentation Library and Chart_1 besides the Standard Symbol Library.

Procedure: (Figure: 5-5)

Step 1  Select S-57 Option (Figure: 5-1)
Step 2  Select Presentation Library. The dialog box appears.

![Presentation Library dialogue box](Figure: 5-5)

5.2.1.1 S52 Edition 3.4

This menu applies the Standard Symbol Presentation (IHO-S52).

5.2.1.2 C-Map ..... 

This menu item allows to apply the Symbol Presentation provided by the chart manufacturer C-Map.

5.2.1.3 Chart 1 selecting

Chart 1 Presentation, all Symbols used for the ECDIS display are shown in a graphical presentation. Their shape and colour are in correspondence to IHO publication S52.
Check the graphical presentation e.g. color on the display or compare the symbol with the “Colour and Symbol Specifications for ECDIS” handbook.
Procedure: (Figure: 5-6)

Step 1  Select Presentation Library. The Dialog Box appears.
Step 2  Select Chart1. A information window appears. Select OK, the Presentation Library List appears.
Step 3  Select the Zoom In function from the Display Menu
Step 4  Position the Zoom In cursor to one of the corners of the color region, then press and continue to hold down the [Left] button. Drag the cursor so that the Zoom In box covers the region to magnify. Release the trackball button when you are done.
Step 5  The following detailed window appears
Step 6  Check the diagonal color line presentation on the ECDIS display or compare the diagonal color line pictures with the “Color and Symbol Specifications for ECDIS” handbook.
Step 7  Do the check by changing the Display Color combinations (chapter Display 6.1.8) like, Bright Sun Colors, Day Colors, Day Colors, Night Colors.
Problem solution
If you cannot recognize any line adjust more Contrast / Brightness.
If this does not solve the problem, please contact the Service department to change the ECDIS Display.
5.2.2 Add/Delete Mariners Objects

This function enables the user to manually add marine objects like buoys ( ), wrecks etc. into the currently loaded chart. The entries are saved and can later be worked on (deleted, moved etc.).

**NOTE**
Mariners Object can only be displayed when the Overlay is switched to Full Display (chapter 5.2.6).

Manual entries are logged within the View update Log File function (chapter 5.2.5) as Mariners Objects and in the text box from the Object info window. Objects placed as Marine Objects… can be deleted.

**Procedure:** (Figure: 5-7)

1. **Step 1** Select S57 Option (Figure: 5-1)
2. **Step 2** Select Add/Delete Mariners Objects... The Dialog Box appears
3. **Step 3** Select an Object
4. **Step 4** Specify the representational form of a object within the chart. If the object has not been assigned to a clear representational form, one of the forms offers (Point, Line or Area) can be selected.
5. **Step 5** Specify the object Attributes.
   - For each object, a list of attributes is provided.
   - An object can only be positioned and placed on the chart when all attributes have been specified and assigned.
   - The entries of the Attribute List must be worked through in order.
5.1 **Step 5.1** Select the 1st entry using the cursor the “Value of attribute” window is opened. Some of the entries can by specified by means of predefined attribute values using the scroll bar. Other entries must be specified manually using the keyboard. The attribute scale maximum and scale minimum refer to the current chart scale and specify the zoom range in which the object can be displayed (e.g. scale maximum 1000 and scale minimum 500000).
Step 6  
Select Place Objects. The object can now be placed on the chart via the cursor or, in case of manual input, by entering the Specify Location value (Latitude and Longitude).

Figure: 5-7  Add/Delete Mariners

In this case it is possible to specify a buoy with more details (Buoys with special purpose “Light” only).

The Edit Manual Object window is displayed only if the selected object has additional functions.

**Procedure:** (Figure: 5-8)

Step 7  
Select the Add button. The Dialog Box List Of Attributes appears. List Values shows the possible values for the function Light and colour. Select the colour assignment White, it is transferred to the buoy. The corresponding windows can be closed.
Step 7

Figure: 5-8 Edit Manual Objects dialog box

By pressing the Close key, the cursor is released for positioning the buoy. The positioned buoy is displayed within the light cone code within the chart.

Figure: 5-9 Add a special object info
Command Buttons:

**Undo Edit**
This function is in connection with their Attributes selected. If the Undo Edit button is operated during or after a attribute specification, the previous attribute specification in the List and the placed Object in the chart is deleted.

**Add Objects**
This function is applied in connection with Type of object Line or Area selected. The line or area planning must be finished by clicking on the Add Object button.

**Delete Objects**
On actuating this button, the Delete functions are activated. This process is recorded within the View Log File List (chapter 5.2.5).

**Procedure:** (Figure: 5-10)

- **Step 1** Select the desired object. The Object Info window appears.
- **Step 2** Select the Object Attribute. The object gets a circle as an overlay marker.
- **Step 3** Select the Del Mariner Object button. A pop up window appears, asking you for confirmation you want to delete or not.

![Figure: 5-10 Del Mariner Object]
5.2.3 Manual Updates

This menu item is designed for the official manual chart correction (equivalent to Notes to Mariners for paper charts).
Chart corrections are announced either from the chart manufacturer or regularly issued Notices to Mariners.
The entries are saved for the sea chart and cannot be visibly deleted from their position.
The object is either deleted or marked as deleted by “/”.
The entries can be moved to another place in the chart. Moved entries are marked by “_”.
Moved entries can be deleted from their position.

New Objects can be placed as Marine Updates...marked by “_”.
These Objects can be deleted.

The official entries are logged as Manual Updates in the View Log File function (chapter 5.2.5) and in the text box from the Object info window.

Procedure: (Figure: 5-11)

Step 1 Select S-57 Option (Figure: 5-1)
Step 2 Select Manual Updates. The Dialog Box appears (Figure: 5-11).
Step 3 Select an Object
Step 4 Specify the representational form of an object within the chart.
If the object has not been assigned to a clear representational form, one of the forms offers (Point, Line or Area) can be selected.
Step 5 Specify the object Attributes.
For each object, a list of attributes is provided.
The attribute list has to be modified according to the update information received.

Step 5.1 Select the 1st entry using the cursor the “Value of attribute” window is opened. Some of the entries can be specified by means of predefined attribute values using the scroll bar.
Other entries must be specified manually using the keyboard.
The attribute scale maximum and scale minimum refer to the current chart scale and specify the zoom range in which the object can be
displayed (e.g. scale maximum 1000 and scale minimum 500000).

**Step 6** Select Place Objects. The object can now be placed on the chart via the cursor or, in case of manual input, by entering the Specify Location value (Latitude and Longitude).

In this case it is possible to specify a buoy with more details (Buoys with special purpose “Light” only).

The Edit Manual Object window is displayed only if the selected object has additional functions.

**Procedure:** (Figure: 5-12)

**Step 7** Select the Add button (Figure: 5-12). The Dialog Box List Of Attributes appears.

List Values shows the possible values for the function Light and colour.

Select the colour assignment White, it is transferred to the buoy. The corresponding windows can be closed.
Figure: 5-12   Edit Manual Objects dialog box

By pressing the Close key, the cursor is released for positioning the buoy. The positioned buoy is displayed within the light cone code within the chart.

Figure: 5-13   Add a special object info
Command Buttons:

**Undo Edit**
This function is in connection with their Attributes selected. If the Undo Edit button is operated during or after a attribute specification, the previous attribute specification in the List and the placed Object in the chart is deleted.

**Add Objects**
This function is applied in connection with Type of object Line or Area selected. The line or area planning must be finished by clicking on the Add Object button.

**Delete Objects**
On actuating this button, the Delete functions are activated.

Procedure: (Figure: 5-14)

1. Select the desired object. The Object Info window appears.
2. Select the Object Attribute. The object gets a circle as an overlay marker.
3. Select the Delete Object button. A pop up window appears, asking you for doing the job or not.
Official chart objects cannot be visibly deleted from their place, they get this */* symbol as an overlay marker. This symbol will mark Objects as manually deleted on the current chart layer.

**Move Objects** On actuating this button you can select the object (using the appropriate symbols like “/”, “\” and “\_\_”).

**Procedure:** (Figure: 5-15)

1. **Step 1** Select the desired object. The Object Info window appears.
2. **Step 2** Select the Object Attribute. The object gets a circle as an overlay marker.
3. **Step 3** Select the Move Object button. A pop up window appears, asking you to do the job or not. Place the cursor at the new position.
Chart Viewer:

S57 charts are made up of several scale ranges. The information extent of the scale ranges varies and is determined via the penetration depth (zoom in/out). If an object is now deleted or inserted in a scale range, this action is restricted only to this scale range. Previous or subsequent scale ranges are not considered in this process. This means that deleted objects are still displayed there, new objects are missing. In order to avoid this missing information, the object information of the scale ranges must be updated after deletion or addition.

After the deletion/insertion of an object, the following steps are recommended.

Select View all chart, it will display the updated object at the first navigation purpose where this object is available centred on the chart. The displayed dataset will be automatically be presented at the smallest scale available. At the same time tree list box and the Delete Object button will be enabled.

Press on the Next button to move to next navigation purpose (e.g. harbour).

Now you can navigate through all chart scales using the Next or Prev button. If there is no smaller scale containing the object then the Next button will be disabled. If you are at most detailed navigation purpose then Prev button will be disable.
5.2.4 Legend...

This menu feature opens an Info Window for the currently loaded chart. The Info Window shows all characteristic data specific for S57 charts.

Procedure: (Figure: 5-16)

Step 1  Select S-57 Options (Figure: 5-1).
Step 2  Select Legend.

Figure: 5-16 Legend S57 chart
5.2.5 View Log File

The menu item View Log File logs all update activities which have been carried out on an S57 chart.

**Procedure:** (Figure: 5-17)

Step 1 Select S57 Options (Figure: 5-1).
Step 2 Select View Log File. The Dialog Box appears.

Respective Log File can be viewed directly or, if a printer is connected, be printed.

![Log File Dialog Box]

**Command Buttons:**

- **Close** Click on Close when you’ve seen enough
- **Print** Click on Print to print out the Log contents on a connected separate printer.
- **Export** Click on Export, to create a file with the contents of the Log List. For this procedure a formatted 3,5” disk must first of all be inserted in the drive.
5.2.6 Overlays

This menu item allows the user to select the SENC information (System Electronic Navigational Chart) to be displayed on the current chart.

Procedure: (Figure: 5-18)

Step 1  Select S57 Options (Figure: 5-1).
Step 2  Select Overlays. The Dialog Box appears.

![Dialog Box for S57 Overlays]

Figure: 5-18  S57 Overlays

**Base Display** permanently retained on the ECDIS display, consisting of:
1 coastline (high water);
2 own ship’s safety contour (to be selected by the mariner);
3 indication of isolated underwater dangers of depths less than the safety contour which lie within the safe waters defined by the safety contour;
4 indication of isolated dangers which lie within the safe water defined by the safety contour such as bridges, overhead wires, etc., and including buoys and beacons whether or not these are being used as aids to navigation;
5 traffic routing systems;
6 fixed and floating aids to navigation;

**Standard Display** to be displayed when the chart is first displayed by ECDIS, consisting of:
1 the Base Display plus;
2 drying line;
3 boundaries of fairways, channels, etc.;
4 visual and radar conspicuous features;
5 prohibited and restricted areas;
6 chart scale boundaries;
7 indication of cautionary notes;

**Full Display** all other information which is not part of the Standard Display, for example:
1 spot soundings;
2 submarine cables and pipelines;
3 ferry routes;
4 contents of cautionary notes;
5 graticule;
6 place names;

**User defined Display**
This functions allows to restore the user defined display settings by a single operator action. See S57 Chart Options..., using the command button

Save settings as “User defined Display”.

**S57 Chart Options....**
With this menu item, additional display information can be turned on or off by pressing the corresponding check boxes. The availability of the check box groups depends on the pre-selected chart feature set (Base Display / Standard Display/ Full Display).

The values for 3 different depth contour lines and the safety depth can be set. Routes and the Antigrounding Searchlight are checked against the Safety Contour. The safety Contour line is displayed in any mode. The other contour lines are only used for visual distinction of different depth areas.

The Safety depth is used to distinguish safe and dangerous spot soundings. The value of the Safety depth can be linked to the Safety contour by using the corresponding check box.
**Command Button:**

Save settings as "User defined Display"

The button is used to store all currently made settings in this dialogue for the User defined Display, which can be recalled by using the menu as described above.

![Figure: 5-19 Option Menu]
5.2.7 C-Map 93/3 Chart Scale

This menu function allows the user to display charts in Automatic mode Normal, Medium or High or at fixed navigational purpose (e.g. harbour, approach).

**Procedure:** (Figure: 5–20)

Step 1  Select S57 Options (Figure: 5–1).
Step 2  Select Overlays. The Dialog Box appears.

![C-Map 93/3 Chart Scale](image)

**Figure: 5–20  C-Map 93/3 Chart Scale**

**Example: Setting Approach**

With this setting, the chart is always displayed as approach chart while it is zoomed. So all the chart object information contained in the approach “navigational purpose” will always be displayed at all scales.
5.2.8 Symbols Type

Using this menu function, buoys and beacons can be displayed either as Simplified Symbols according to IHO-paper S52.

Procedure: (Figure: 5-21)

Step 1 Select S-57 Options (Figure: 5-1).
Step 2 Select Symbol Type. The Dialog Box appears.

![Symbol Presentation](image)

Figure: 5-21 Symbol Presentation
5.2.9 **Presentation Date (Auto)**

This menu function allows the user to find out date-dependant objects in the chart, such as seasonal buoys, are only to be displayed over a certain period. Other objects, such as a traffic separation schema, may have a date on which they are introduced or discontinued.

**Procedure:** (Figure: 5-22)

Step 1  Select S-57 Options (Figure: 5-1).
Step 2  Select Presentation Date (Auto). The Dialog Box appears.

![Presentation Time Dialog Box](image)

Figure: 5-22 Presentation Time
6 DISPLAY MENU

The ECDIS display is defined by the two values for scale and center. Scale is the distance from the top to the bottom of the display and can be any value from 1 NM to 3999 NM. Center is simply the latitude and longitude coordinates that are located at the center of the display. The display can be centered anywhere on ECDIS’s latitude/longitude grid, which means anywhere in the world.

You can control the scale and center of the display by zooming in or out, or by specifying a new scale and center. You can save display settings (called “areas”) so that at anytime you can return to it. In addition, you can use the Ship Auto Center feature or the directional keys to scroll the display and ensure that your ship is always in view. The information panel to the right of the display area shows the display scale in the chart information area. To determine the display center, either position the cursor at the center of the display, then refer to the status bar for the cursor’s coordinates, or choose the Scale and Center command in the Display menu and look at the coordinates in the center box.

6.1 DISPLAY MENU COMMANDS

use the pull down menu

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<td></td>
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Figure: 6-1 Display Menu
## Table 6-1 Overview Display Menu

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<th>Display Commands</th>
<th>Function</th>
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<td>Allows you to select an area of the display on which to zoom-in. Enlarging the selected area so that it fills the display.</td>
</tr>
<tr>
<td>6.1.1.2 Zoom Out</td>
<td>Allows the user to specify the degree to zoom out the display.</td>
</tr>
<tr>
<td>6.1.2 Default Scale</td>
<td>Changes the scale of the display to the default chart scale.</td>
</tr>
<tr>
<td>6.1.3 Largest Scale</td>
<td>Changes the scale of the display to largest chart scale.</td>
</tr>
<tr>
<td>6.1.4 Scale and Center...</td>
<td>Changes the settings on the display to a specified scale and center.</td>
</tr>
<tr>
<td>6.1.5 View Area.....</td>
<td>Saves, opens, and deletes area views pre-defined by the user.</td>
</tr>
<tr>
<td>6.1.6 Ship Auto Center...</td>
<td>Automatically repositions the display so that Own ship returns to the center when it reaches a user defined distance from the edge of the display.</td>
</tr>
<tr>
<td>6.1.7 True Scale Icon</td>
<td>Own ship symbol will be displayed on scale as silhouette.</td>
</tr>
<tr>
<td>6.1.8 Bright Sun Colors</td>
<td>Changes display colors to bright on white background.</td>
</tr>
<tr>
<td>6.1.8.1 Day Colors-White</td>
<td>Changes display colors to dark on white background.</td>
</tr>
<tr>
<td>6.1.8.1 Dusk Colors</td>
<td>Changes display colors to dim on black background.</td>
</tr>
<tr>
<td>6.1.8.1 Night Colors</td>
<td>Changes display colors to dim a level down on black background.</td>
</tr>
<tr>
<td>6.1.9 Toolbar</td>
<td>Turns on or off the display of the toolbar.</td>
</tr>
<tr>
<td>6.1.10 StatusBar</td>
<td>Turns on or off the display of the status bar.</td>
</tr>
<tr>
<td>6.1.11 Info Panel</td>
<td>Turns on or off the display of the information panel and allows selection of NAV or TRACK display.</td>
</tr>
</tbody>
</table>
6.1.1 The Zoom Feature

The Zoom feature enables you to quickly change the scale of the display. The zoom activities are displaying as second information in the Information Panel (Figure: 6-2).

![Information Panel Diagram]

1. The name of the chart currently being displayed
2. The current vertical scale of the display (in NM) and the ratio between the size at which an object is displayed to its actual size
3. The vertical scale of the chart and the ratio at which the display chart can be viewed in order to be at scale
4. Indicates the current overlay status (Base Display, Standard Display, Full Display)

6.1.1.1 Zooming In

Select Zoom In from the Display menu or press the Zoom In Key on the toolbar.

Procedure: (from display menu)

Step 1: Select the display menu (Figure: 6-1).
Step 2: Select Zoom In, the cursor changes into the Zoom In shape.
Step 3: Position the Zoom In cursor on one of the corners (called the anchor point) of the region you want to magnify, then press and continue to hold down the [Left] button (trackball). Drag the cursor so that the Zoom In box covers the region you want to magnify.
NOTE
Make sure to hold down the [Left] button until the box is drawn to the size you desire. If you have drawn the box to the desired size, but want to reposition it, before you release the [Left] button, hold down [Shift] and move the cursor until the box is in the desired position. The box remains the same size, while its position in the display changes.

Step 4  Release the trackball button when you are done.

Figure: 6-3   Zoom In per Drag an Drop after pressing the Zoom In Key
6.1.1.2 Zooming Out

Use the Zoom Out command from the Toolbox to quickly change the display scale from its current value to one that is one-and-one-half times (150%) larger. You can use the command repeatedly until the scale reaches 6,550 NM. The Zoom Out command does not affect the center of the display.

Select Zoom Out from the Display menu, or press the Zoom Out key on the toolbar.

Procedure:

Step 1 Select the display menu (Figure: 6-1).
Step 2 Select Zoom Out, select the desired Zoom Out factor. The display is zoomed out.

![Zoom menu command](image)

Figure: 6-4 Zoom out menu command
6.1.2 Default Scale

Display the current chart at the default scale.

6.1.3 Largest Scale

Load and display the chart with the largest available scale at the current display position.

6.1.4 Scale and Center Command

When you want to center the display on a specific location or change the scale to a particular value, use the Scale and Center command. When the command is selected, the ECDIS displays the Scale and Center dialog box.

6.1.4.1 Change the Scale and Center of the Display

Procedure:

Step 1 Select the display menu (Figure: 6-1).
Step 2 Select Scale and Center. The dialog box appears. The current display center appears in the Latitude and Longitude boxes and the current scale appears at the bottom of the scale area. Unit of measure is NM.
Step 3 To change the scale of the display, either click on the desired scale, or, click in the text box, then type the desired scale, or, use the scroll bar to change the value in the text box.
Step 4 To change the center of the display use the Latitude and Longitude boxes to enter the desired coordinates.
Step 5 Press on OK, or to reset the scale and center back to the value at which you opened the dialog box, by clicking on Reset.
6.1.5 **View Area Command**

One of the fastest ways to reposition the display is to use ECDIS’s View Area feature. An Area is simply a display storing a combination of scale and center on a specific chart that you have named and saved. You will find the View Area feature especially helpful if there are certain geographic regions you display frequently.

When you change the area you are viewing, your plot and route information remains open. It is as if you are viewing a different part of the globe for a moment. ECDIS continues to monitor your route for unsafe and restricted areas while you are viewing a different area. You may return to your open route at any time by using the Show Route command under the Waypoints menu.

Figure: 6-5 Scale and Center Dialog Box
Procedure:

Step 1  Select the display menu (Figure: 6-1).
Step 2  Select View Area. The dialog box appears.

The names of all the areas you have saved appear in the list box. When you select an area name, its scale and center are displayed at the bottom of the dialog box. If there are no areas listed, the scale and center of the current display is shown.

![View Area dialog box](image)

Figure: 6-6 View Area dialog box

6.1.5.1 Save an Area

Procedure:

Step 1  Select the display menu (Figure: 6-1).
Step 2  Select View Area. The dialog box appears.
Step 3  Set the display to the chart and dimensions you want to save.
Step 4  Click in the text box, then type an area name of up to 25 characters.
Step 5  Click on Save.

NOTE

Plot and route information is not saved with an Area.
6.1.5.2 Open an Area

Procedure:

Step 1 Select the display menu (Figure: 6-1).
Step 2 Select View Area. The dialog box appears.
Step 3 Click on the name of the area you want to open. The area name appears in the text box and its scale and center appear below the list box.
Step 4 Click on Open.

6.1.5.3 Delete an Area

Procedure:

Step 1 Select the display menu (Figure: 6-1).
Step 2 Select View Area. The dialog box appears.
Step 3 Click on the name of the area you want to delete.
Step 4 Click on Delete.
6.1.6 Keeping Your Ship in the Display Area (Ship Auto Center)

When you turn on the Auto Center feature, ECDIS automatically moves the displayed chart area so that your ship is always in view. When your ship reaches a point near the edge of the display (that you determine), ECDIS automatically recalculates the center of the display, then re-centers it so that your ship is at its center. If Ship Auto Center is off and your ship travels outside the display, ECDIS continues tracking your ship; you just can’t see it. To locate your ship, simply turn on Ship Auto Center, or click the Center on Ship button on the toolbar. Ship Auto Center automatically turns off if you scroll the display 3 times in any direction.

6.1.6.1 Turning ON or OFF Auto Center

Procedure:

Step 1  Select the display menu (Figure: 6-1).
Step 2  Select Auto Center. The dialog box appears (Figure: 6-7).
Step 3  Click inside the Auto Center Enabled check box.
   • Allows the ship motion by using a value from 1 ..... 30% before next redraw.
     When the ship has traveled across e.g. 5% of the screen ECDIS will recenter the display.
   • Off Center allows the ship displaying by using a value from 0 (display center) ...70% of the display.
Step 4  Select Use Toolbar button to enable / disable Auto Center, the Ship Auto Center function may be switched on.
        Otherwise the toolbar button will only center the ship on the chart without effecting the Auto Center function.
6.1.7 True Scale Icon

The rectangular ship symbol is not a fixed size symbol but adjusts to the scale of the chart. This symbol is used at all times except when ECDIS is not receiving navigational information or when the ship cannot be drawn to scale. It also has a directional arrow displaying the ship’s heading.

6.1.8 Display Colors

ECDIS provides you with a variety of color combinations for easier viewing. When traveling at night, it might be easier to see the screen using a black background with bright colors. During the daytime hours, it might be easier to view the display on a white background with dark colors. The Bright Sun Colors, Day Colors - White, Day Colors - Black, Dusk Colors and Night Colors command allows you to select the colors most appropriate for you. A check mark appears in the pull-down menu next to the command currently being viewed. The display colors are described as follows:

- Bright Sun Colors - Bright on white background.
- Day Colors - White - Dark on white background.
- Day Colors - Black - Bright on black background.
- Dusk Colors - Fluorescent on black background
- Night Colors - Fluorescent dim on black background.
6.1.8.1 Changing Display Colors

The following colors for viewing are available from the display menu.

- Bright Sun Colors,
- Day Colors - White
- Day Colors - Black
- Dusk Colors
- Night Colors, Keystrokes

6.1.9 Turning ON/OFF the Toolbar

To turn on/off the toolbar, select the **Toolbar** command from the Display menu.

6.1.10 Status Bar

Toggle the status bar on/off, select the Status Bar from the Display menu.

6.1.11 Information Panel

ECDIS allows you to control the display of e.g. 4 different types of the information panel. You can also select to remove them from the display area so that you may have a wider viewing area.

Procedure:

Step 1  Select the display menu (Figure: 6-1)
Step 2  Select Info Panel. The dialog box appears (Figure: 6-8)
Step 3  Click on the desired Infopanel e.g. Nav.
Step 4  Click on the OK button, the Infopanel appears.
Figure: 6–8 Select Infopanel
7  SHIP MENU

7.1  SHIP MENU COMMANDS

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<tr>
<td>7.1.2 Position Offset...</td>
<td>Corrects the ship’s position based on an ARPA target with a known position.</td>
</tr>
<tr>
<td>7.1.3 Own Ship Vector...</td>
<td>Turn on or off course vector, heading line or antigrounding search-light.</td>
</tr>
<tr>
<td>7.1.4 Mark at Ship</td>
<td>Place a ship mark with a time level at the ship’s position.</td>
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<tr>
<td>7.1.5 Anchor Watch...</td>
<td>Allows ECDIS to monitor the drift of the ship while anchored.</td>
</tr>
<tr>
<td>7.1.6 Guard Zone...</td>
<td>Place an alarm zone around Own Ship to monitor intruding ARPA targets at a defined distance.</td>
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### Ship Command Function

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<td>Turn off the autopilot, places a mark at ship's location, (and sounds a (general) ship alarm when activated). May be cancelled.</td>
</tr>
<tr>
<td>7.1.8 Overboard All-Clear</td>
<td>Clear the man overboard alarm and posts an &quot;All Clear&quot; entry to the Event Log.</td>
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</table>
### 7.1.1 Ship Info Command

ECDIS provides a feature that increases the accuracy of the display of navigational data. The Ship Info command is where you enter the dimensions of the vessel, as well as specify where the navigational antennas are located. ECDIS uses the entered information in many ways. First, it draws the ship symbol so that it is proportional to the specified vessel size. More importantly, because ECDIS knows where on the ship the antennas are located, it can offset the ship symbol from that point, giving you a more accurate representation of your position relative to other objects. In addition, ECDIS uses the information to more accurately draw tracks and the course line, as well as to calculate the necessary safety alarms.

**Procedure:** (Figure: 7–2)

1. Step 1  Select the ship menu (Figure: 7–1).
2. Step 2  Select Ship Info... The dialog box appears.

**NOTE**

Only Safety Contour and Safety Depth can be changed. All other values can only be modified in service mode.
Figure: 7-2  Ship Info dialog box
### 7.1.2 Position Offset

When displaying a signal from a navigational aid using the ARPA Radar Tracking command, the target may not appear exactly over the navigational aid. When this occurs, make sure your electronic charts have the most recent update. If this is the case, the error may then be due to incorrect position information from your navigational positioning device. You may adjust this situation using the Position Offset command.

**NOTE**
Ensure Radar Range and Bearings are correct before performing offset.

![ECDIS display](image)

**Figure: 7-3 Example**
7.1.2.1 Changing Ship's Position

**Procedure:** (Figure: 7-3 and Figure: 7-4)

**Step 1** Select the ship menu (Figure: 7-1).

**Step 2** The cursor changes to target shape and the Ship Offset dialog box appears. (Figure: 7-4).

**Step 3** Enter the offset using the display
   a) Click on ARPA target. The targets label appears in the Selected area.
   b) Click on the Navigational Aid over which the target should appear. The navigational aid label appears on the Selected area.

Enter the offset using latitude and longitude
   a) Click on OK.
   The new offset (in meters) appears in the Latitude and Longitude box, and the ship is repositioned on the screen.

**Step 4** To cancel an offset
   a) Select Position Offset from the Ship menu. The cursor changes to target shape, and the Ship Offset dialog box appears.
   b) Click on “Zero” at the bottom of the dialog box.
   The entries in the latitude and longitude box will return to zero, and the boat is repositioned on the display.
   c) Click on “OK”.

Figure: 7-4 Position Offset
7.1.3 The Ship’s Heading Line and Anti-grounding Look Ahead Own Ship Course Vector

**WARNING**

FOR ANTI-GROUNDING INFORMATION TO BE ACCURATE, ALL CHART DATABASES MUST BE UP-TO-DATE AND VALID.

ECDIS provides options to display course vectors and heading line as well as a search light.

Anti-grounding validation is always performed on the most detailed chart available, which may not be the chart currently displayed. Because charts differ in respect to depth areas, it may appear as if anti-grounding validation is incorrect; but, if you display the most detailed chart for the area, you will find that anti-grounding validation is being performed accurately for this chart. Due to chart inaccuracies, anti-grounding validation is not performed on Background, World, or General charts.

7.1.3.1 Heading Line and Course Vector

1. **Heading Line** – True Heading, black in color, which displays the ship’s heading received from the gyro. You may select to the vector drawn to the edge of the screen or as an indicator at the ship symbol.

2. **Course Vector** – Course over Ground which displays the ship’s course in black dashed line. You may select the vector length based on your speed.

The searchlight scans ahead of the ship looking for restricted zones (Based on chart and ship information). The time interval, the searchlight looks ahead, is determined by the length of the course vector.

**NOTE**

The length of your own ship course vector also determines the length of the course vector for ARPA and AIS targets.
Procedure: (Figure: 7-5 and Figure: 7-6)

Step 1 Select the ship menu (Figure: 7-1).
Step 2 Select Own Ship Vector. The dialog box appears (Figure: 7-5).

Step 3 Select your favored Ships Vector presentation in the chart (Figure: 7-6).

Figure: 7-5 Own Ship Vector

Step 3 Select your favored Ships Vector presentation in the chart (Figure: 7-6).

Figure: 7-6 Ships Vector Presentation (example)
7.1.4 Placing Ship Marks

Mark is an placed at the ship’s location and labeled with the time it was set, Figure: 7–7.

![Placing ship marks](image)

Figure: 7–7 Placing Ship Marks

You can use the **Mark at Ship** command to annotate tracks with your own ship marks. The Auto Label command will place a ship mark at your boat’s location at specified time intervals, nautical mile intervals, or at specific headings.

**Mark at Ship** command will place a single ship mark at your ship’s location when the command is chosen. You may find these commands useful for documenting such events as the arrival at a waypoint.

---

**NOTE**

ECDIS also sets a ship mark whenever a new navigation device becomes active (see “Selecting the Navigation Devices” (chapter 12.1.1)). These marks are labeled with a one- or two-letter abbreviation for the type of device in use.
7.1.5 **Anchor Watch**

ECDIS can monitor the drift of the ship while anchored. When Own ship (DR Point) travels outside the range, ECDIS gives an audible alarm and displays a warning message.

**Procedure** (Figure: 7-8)

1. **Step 1** Select the ship menu (Figure: 7-1).
2. **Step 2** Select Anchor Watch. The dialog box appears.
3. **Step 3** Click inside the Anchor Watch Enabled check box. The ship's current location appears beneath the check box.

**NOTE**

When you re-open the Anchor Watch dialog box, the displayed position is the position of the ship when you enabled Anchor Watch. To re-set the anchor watch to the current ship’s position, disable the Anchor Watch Enabled check box, then re-enable it.

4. **Step 4** Enter the range (distance from start position) for which you want ECDIS to give a warning if crossed by own ship.

![Figure: 7-8 Anchor Watch Dialog Box](image)
7.1.6 Guard Zone

The Guard Zone command allows you to tell ECDIS to monitor the ARPA target distances and to generate a warning message if a target enters the specified range. You may ask ECDIS to guard any where between 1 and 30,000 meters.

**Procedure:** (Figure: 7-9)

1. Step 1 Select the ship menu (Figure: 7-1).
2. Step 2 Select Guard Zone.... The dialog box appears.
3. Step 3 Click inside the Guard Zone Enabled check box. The ship’s current location appears beneath the check box.
4. Step 4 Enter the range (in meter) for which you want the alarm to sound if an ARPA Target is intruding the area defined by this range.

![Guard Zone Dialog Box](image)

**Figure: 7-9 Guard Zone Dialog Box**
7.1.7 Man Overboard

When the Man Overboard command is selected, ECDIS posts an entry to the Event Log. You may sound the alarm immediately by clicking on Alarm (a second MOB entry and Alarm entry will be posted to the Event Log). If the Alarm is signaled, ECDIS disconnects the autopilot, and places a ship mark on the display.

The Man Overboard All Clear command turns off the general alarm and posts a “man overboard cleared” entry in the Event Log.

Procedure: (Figure: 7-11)

Step 1 Select the ship menu (Figure: 7-1).
Step 2 Select the MOB button or select Man Overboard…command.

ECDIS places special MOB marker with time entry on the chart, set an Alarm (acoustic and visual in the message display area).

Following MOB information displays in the status bar:

Position of the MOB, distance and bearing to the MOB
Step 2

special MOB marker with time entry

Position of the MOB, distance and bearing to the MOB

Figure: 7-10  Man Overboard event

(see log menu)

Figure: 7-11  Current Log MOB information
7.1.8 Clear or Cancel Man Overboard - Alarm

Procedure:

Step 1  Select the ship menu (Figure: 7-1).
Step 2  Select Overboard All-Clear.
        ECDIS turns off the alarm and posts an entry to the ship.
8 ROUTES MENU

8.1 ROUTE PLANNING

ECDIS has sophisticated route planning capabilities. During route planning, each route section is automatic checked for free and safe passage of the ship. The automatically check-up comprises Prohibited Areas, Own Ship’s Contours, Buoys and Beacons known from and indicated in the sea charts (CM93/3, S57).

In case a dangerous situation is realized during route planning, a corresponding alarm is displayed in the Alarm Window (chapter 8.2.1.1).

ECDIS displays waypoints as circles. The active waypoint has an additional circle around it. If you label your waypoints, the labels appear below the marker. When a route is established, the following information is automatically displayed:

1. A planned track (course line) between the waypoints (is red in color and appears as a thick dashed line between waypoints and a dashed line between the ship and the active waypoint).

   Using the route planning feature, a primary as well as a secondary route can be created. The route priority can be selected via menu function as needed.

   The primary route is displayed in thick, red, dashed lines.
   The secondary route is displayed in thin, red, dashed lines.

2. The planned turning arc/radius (red in color); the turning arc which was established when you entered the waypoint.

   The turning arc/radius is limited to maximum 135°.

   This limit value is checked during route planning and if this limit is exceeded an error message is released.

3. Crosstrack limit boundaries: width defined by the current cross-track error alarm setting.

4. The wheelover point, or the point at which own ship must start turning to follow the predicted turning arc.
The wheel-over point position is controlled by the “Turning Response” box in the Autopilot dialog box. Please see “Driving an Autopilot”, chapter 12.1.5.

If you wish to have the current turning arc match the planned turning arc, you will need to change either your ship’s speed or the planned rate of turn (see Autopilot dialog box, chapter 12.1.5).
8.1.1 Route Description

ECDIS does not select an active waypoint until the Steer to Track dialog box has been opened and the active waypoint has been selected.

1. **Waypoint**
2. **Ship**, the position displays in field -2- from the information panel
3. **Ships vector True Heading**, the arrowhead displays the ships position after 6 min.
4. **Planned speed**
5. **Limit for the XTD**, value data see information panel -6-
6. **Active waypoint**, value data see information panel -7-
7. **Scale bar > 1:80 000**, part length in grey and orange color.

Scale bar < 1:80 000, part length in black and grey color.

Figure: 8-1 Route Description
The following information is displayed:

1) Waypoints appear as a circle and an additional circle appearing around the active waypoint.

2) Planned track (course line) between the waypoints (is red in color and appears as a thick dashed line between waypoints and a thick dashed line for the approach manoeuvre).

3) Planned turning arc/radius (red color); the turning arc which was established as you entered the waypoint.

4) Fairlanes; defined by the current cross-track error alarm setting.

5) Ship’s bearing to the active waypoint.
   - Primary Routes indicates in dashed red thick line.
   - Secondary Routes indicates in dashed orange thin line.

6) Route planning. You can create two routes in the actual chart. The active route is called Primary Route (indicates in dashed red thick line) and the passive route is called Secondary Route.

If you wish to have the predicted turning arc match the planned turning arc, you will need to change either your ship’s speed or the planned rate of turn (Autopilot dialog box/Integration menu).
8.1.1.1 Handling Primary Route and Secondary Route

While working on a route managing it is possible to plan and edit two routes at the same time.

Route priorities are indicated by the entry Primary and Secondary in the menu guide (chapter 8.2.4 Toggle Routes).

The first route that has been created or loaded is defined as Primary Route. The second route created or loaded is defined as Secondary Route.

If the Primary Route is deleted by means of the menu function Clear Route, the Secondary Route is automatically defined as Primary Route.

The Routes Menu indicates the current route situation (Figure: 8-2).

<table>
<thead>
<tr>
<th>Routes</th>
<th>Nav Tools</th>
<th>Plot Layer</th>
<th>Logs</th>
<th>Integr</th>
<th>Routes</th>
<th>Nav Tools</th>
<th>Plot Layer</th>
<th>Logs</th>
<th>Integr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edit Primary Route...</td>
<td>Create new Secondary Route...</td>
<td></td>
<td></td>
<td></td>
<td>Edit Primary Route...</td>
<td>Create new Secondary Route...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic Route Planning / Port Information...</td>
<td>Route Manager...</td>
<td></td>
<td></td>
<td></td>
<td>Automatic Route Planning / Port Information...</td>
<td>Route Manager...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toggle Routes...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Toggle Routes...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Save Primary Route...</td>
<td>Show Primary Route...</td>
<td>List Primary Route...</td>
<td></td>
<td></td>
<td>Save Primary Route...</td>
<td>Show Primary Route...</td>
<td>List Primary Route...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear Primary Route...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Clear Primary Route...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

there is only Primary Routes available

there are Primary and Secondary Routes available

Figure: 8-2 Route Menu Indications
8.1.1.2 Primary and Secondary Route using in a Single ECDIS system

Using the context sensitive pop up window you will find following restrictions between the Primary and Secondary Route window.

Place the Target Cursor on a waypoint from a Primary or Secondary Route and click the middle button from trackball.

![Primary Route and Secondary Route pop up windows](image)

Figure: 8-3 Pop up windows for Primary and Secondary Route

8.1.1.3 Primary and Secondary Route using in a ECDIS systems with Server and Client management.

Using the context sensitive pop up window you will find following restrictions between the Primary and Secondary Route window (Server and Client Rights chapter 8.2.18).

Place the Target Cursor on a waypoint from a Primary or Secondary Route and click the middle button from the trackball.
<table>
<thead>
<tr>
<th>Primary Route (Server)</th>
<th>Primary Route (Client)</th>
<th>Secondary Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edit Primary Route...</td>
<td>List Primary Route...</td>
<td>Edit Secondary Route...</td>
</tr>
<tr>
<td>List Primary Route...</td>
<td>Route Monitoring...</td>
<td>List Secondary Route...</td>
</tr>
<tr>
<td>Route Monitoring...</td>
<td>Track Control...</td>
<td>Check Secondary Route ...</td>
</tr>
<tr>
<td>Track Control...</td>
<td>Send Route to Radar</td>
<td>Chart Information...</td>
</tr>
<tr>
<td>Send Route to Radar</td>
<td>Check Primary Route...</td>
<td>Cancel ......</td>
</tr>
<tr>
<td>Check Primary Route...</td>
<td>Show Primary Route Check Results</td>
<td></td>
</tr>
<tr>
<td>Chart Information...</td>
<td>Chart Information...</td>
<td></td>
</tr>
<tr>
<td>Cancel ..</td>
<td>Cancel ..</td>
<td></td>
</tr>
</tbody>
</table>

Figure: 8–4  Pop up windows for Primary and Secondary Route (Server and Client Rights)
8.2 ROUTES MENU COMMANDS

Figure: 8-5 Routes Menu
### Table 8-1 Overview Route Menu

<table>
<thead>
<tr>
<th>Routes Commands</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.2.1 Create Route...</td>
<td>Create or edit a primary or secondary route.</td>
</tr>
<tr>
<td>8.2.2 Automatic Route...</td>
<td>Allows you to plan a route automatically. The automatic route plannin-</td>
</tr>
<tr>
<td></td>
<td>ging is only available if the Jeppesen (C-MAP) “Professional +” data-</td>
</tr>
<tr>
<td></td>
<td>base is installed.</td>
</tr>
<tr>
<td>8.2.3 Route Manager</td>
<td>Route Manager dialog (Open, Delete, Export, Import, Protect).</td>
</tr>
<tr>
<td>8.2.4 Toggle Route</td>
<td>Toggle primary and secondary route.</td>
</tr>
<tr>
<td>8.2.5 Save Primary Route...</td>
<td>Names and saves a route to the route list.</td>
</tr>
<tr>
<td>8.2.6 Show Primary Route..</td>
<td>Center the display on the active waypoint of the open route. If an</td>
</tr>
<tr>
<td></td>
<td>active waypoint is not selected, it centers the display on the first</td>
</tr>
<tr>
<td></td>
<td>waypoint of the open route.</td>
</tr>
<tr>
<td>8.2.7 List Primary Route...</td>
<td>Shows a waypoint list of the route.</td>
</tr>
<tr>
<td>8.2.8 Review Route Check...</td>
<td>Display the results of the last route check against the (Vector) Chart.</td>
</tr>
<tr>
<td>8.2.9 Clear Primary Route</td>
<td>Clears the open route from the display. Turns off route tracking.</td>
</tr>
<tr>
<td>8.2.10 Send Route to Radar</td>
<td>Sends and displays route information to your radar. This menu command</td>
</tr>
<tr>
<td></td>
<td>will only appear if you have an ECDIS Interfaced to a NSC Radar.</td>
</tr>
<tr>
<td>8.2.11 Route Monitoring...</td>
<td>Start/Stop Route Monitoring.</td>
</tr>
<tr>
<td>8.2.12 Track Control.</td>
<td>Start/Stop Track Control (Option).</td>
</tr>
<tr>
<td>8.2.13 ETA Calculation</td>
<td>With this function the parameters for the ETA calculation can be set.</td>
</tr>
<tr>
<td>8.2.14 Distance–To–Run../Planned</td>
<td>Calculates and shows Distance–To–Run symbol positions on the route.</td>
</tr>
<tr>
<td></td>
<td>Position...</td>
</tr>
<tr>
<td></td>
<td>Shows time of a Planned Position / shows date and time for a planned</td>
</tr>
<tr>
<td></td>
<td>position along the route.</td>
</tr>
<tr>
<td>8.2.15 Pre–Departure Checklist..</td>
<td>Allows the user to write a checklist for e.g. what is to do before leav-</td>
</tr>
<tr>
<td></td>
<td>ing the harbour, or before starting a route, or changing a route.</td>
</tr>
<tr>
<td>8.2.16 Alarms...</td>
<td>Changes WOP alarm time setting.</td>
</tr>
<tr>
<td>8.2.17 Check Route..</td>
<td>Checks a Route (Primary or Secondary) passing a restricted area (e.g.</td>
</tr>
<tr>
<td></td>
<td>military zone).</td>
</tr>
<tr>
<td>8.2.18 Route Server Rights</td>
<td>Option</td>
</tr>
<tr>
<td></td>
<td>Allows you to take the “Route Server Rights”.</td>
</tr>
</tbody>
</table>
8.2.1 Edit Route Command

When you choose the Edit Route command, ECDIS displays the Edit Route dialog box with the name of the open route (Primary or Secondary) in the title bar. Before creating a new primary or secondary route the last primary or secondary route has to be cleared.

Procedure:

Step 1  Select the route menu (Figure: 8-5).

a) For creating a new route (chapter 8.2.1.1).

b) For performing actions in a current loaded primary or secondary route (chapter 8.2.1.2).

Safety checks
While you are entering waypoints, ECDIS automatically checks the route and fairlane (cross track limits) for unsafe and restricted areas as well as to see if they are reasonable (relative to their geometrical coordinates). The check results may be reviewed in a separate window (chapter 8.2.8).

If the geometrical limits are exceeded, you may either change the waypoint or the waypoint radius.

NOTE
A route which contains dangers or which exceeds geometrical limits is indicated by a red route name on the Information Panel.
A route which contains warning is indicated by an orange route name on the Information Panel.
8.2.1.1 Creating a Route

NOTE
The larger the scale of the display, the more accurately you can locate specific coordinates. If you want to place a waypoint at a location that is not in view, you can move the display using the Zoom feature, the Scale and Center command, the View Area command, or the arrow keys while the Edit Route dialog box is open. Observe the Alarm Window (Information Panel), consider the messages about:
Prohibited Areas, Own Ships Contours, Bouys and Beacons.

Before creating a new primary Route the last primary Route has to be cleared. The same applies to the secondary route. Select Clear Route from the Routes menu (chapter 8.2.9).

Select the desired chart area for the route planning.

Procedure: (Figure: 8-6)

Step 1 Select the route menu (Figure: 8-5).
Step 2 Select Clear Route.
(If the menu entry is colored in black otherwise follow Step 3)
Step 3 Select Create new Primary Route or select Create new Secondary Route.
Step 4 Select the first waypoint position by cursor, press the [Left] button. The waypoint number and the waypoint coordinates are shown in the waypoint list.
Step 5 or- Select numerical extend mode, enter Lat/Long, press the Extend button. The waypoint number and the waypoint coordinates are shown in the waypoint list.
Step 6 Select the next waypoint either by cursor or by numerical input (repeat Step 4 or 5).
Step 7 Select the OK button, route planning is finished. The route can now be saved under any name in a route list which is organized under the menu function Route Manager.
Figure: 8–6  Creating a new Route
Alarm overview for areas which the ECDIS detect and indicates in the Alarm Window:

<table>
<thead>
<tr>
<th>Traffic separation zone</th>
<th>Submarine transit lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic routing scheme crossing or roundabout</td>
<td>Ice area</td>
</tr>
<tr>
<td>Traffic routing schema precautionary area</td>
<td>Channel</td>
</tr>
<tr>
<td>Two way traffic route</td>
<td>Fishing ground</td>
</tr>
<tr>
<td>Deep water route</td>
<td>Fishing prohibited</td>
</tr>
<tr>
<td>Recommend traffic lane</td>
<td>Pipeline area</td>
</tr>
<tr>
<td>Inshore traffic zone</td>
<td>Cable area</td>
</tr>
<tr>
<td>Fairway</td>
<td>Anchor prohibited</td>
</tr>
<tr>
<td>Restricted area</td>
<td>Dumping ground</td>
</tr>
<tr>
<td>Caution area</td>
<td>Spoil ground</td>
</tr>
<tr>
<td>Offshore production area</td>
<td>Dredged area</td>
</tr>
<tr>
<td>Areas to avoided</td>
<td>Cargo transshipment</td>
</tr>
<tr>
<td>Military practice area</td>
<td>Incineration area</td>
</tr>
<tr>
<td>Seaplane landing area</td>
<td>Special protected areas</td>
</tr>
</tbody>
</table>
8.2.1.2 Route Edit Operations

**Procedure:** (using the menu structure)

*Step 1* Select the route menu (Figure: 8–5).

*Step 2* If no route loaded select Route Manager, select a route from the list box, click *Open as Primary* or *Open as Secondary* button.

*Step 3* Select *Edit Primary Route* or select *Edit Secondary Route*. The *Edit Primary* dialog box appears.

**Procedure:** (using the pop up window per cursor)

*Step 1* Place the cursor on a waypoint and click on the middle button. The pop up window appears.

*Step 2* Select *Edit Primary Route* entry.

Figure: 8–7 Primary Route dialog box (Track Control not active)
In place editing of waypoint properties is activated by double-clicking into a list property field (see Figure: 8–8).

Figure: 8–8  Inplace editing

Setting the leg XTD field empty will activate the route XTD value for this leg.

(1) Option button Route: Num. Extend selected

Extending a route is as simple as entering new waypoints - ECDIS automatically adds them to the end of the route. Use the Edit Route command to enter waypoints just as you do when creating the route; either select their location in the display or specify their coordinates in the Latitude and Longitude boxes within the new waypoint area.

Procedure: (e.g. using the pop up window per cursor)

Step 1.1 Place the cursor on a waypoint and click on middle button.
The pop up window appears.

Step 1.2 Select Edit Primary Route entry.

Step 1.3 Select the action point Num. Extend.

Step 1.4 Click on the Latitude and Longitude fields in the new waypoint area, type in the hemisphere, degrees and minutes.
or Edit the Bearing and Distance fields to add a new relative position.

Step 1.5 Click on the Label field in the new waypoint area and enter a label.

Step 1.6 Click on the Radius field in the new waypoint area and enter the desired value.

Step 1.7 Click on Extend. The waypoint appears in the waypoint list, and a waypoint symbol appears in the display.

To enter additional waypoints, repeat steps 4 – 7. A waypoint
symbol appears at each location you specify and the route is extended with fairlanes and a planned track (dashed).

**Step 1.8** Click on Ok. The Save Route dialog box appears.

**Step 1.9** To save the route, type a name of up to 25 characters in the text box, then click on OK. If you do not want to save the route, click on Cancel.

(2) **Option button Route: Extend selected**

Extending a route is as simple as entering new waypoints - ECDIS automatically adds them to the end of the route. Use the Edit Route command to enter waypoints just as you do when creating the route; select their location in the display.

**Step 2.1** To extend the route, enter waypoints in the display per cursor.

**Step 2.2** Select the OK button, if the a route extending is finished.

The Save Route dialogue box appears displaying the name of the route.

**Step 2.3** To save the route using the same name, click on OK. If you want to save the route using a new name of up to 25 characters, then click on OK. If you do not want to save your changes, click on Cancel.

(3) **Option button Route: Change selected** *(Figure: 8-9)*

You can change a waypoint’s location either by moving it in the display or by using the Latitude and Longitude boxes to specify new coordinates.

**Step 3.1** Using the target cursor

Position the cursor over the desired waypoint and click the [Left] button or select the waypoint in the list box. Position the cursor at the Waypoints new location and click the [Left] button. The waypoint is repositioned in the display and the route is redrawn. The Waypoints new coordinates are displayed in the Waypoint list box.

**or** Using waypoint list in the dialog box

Double click on the desired waypoint in the Latitude and Longitude
fields.
Click outside the editable fields --- i.e. click on the number column. The waypoint is repositioned in the display and the route is redrawn.

**NOTE**
Datum is always WGS 1984.

**Step 3.2** Select the OK button, if the a route changing is finished.
The *Save Route* dialogue box appears displaying the name of the route.

**Step 3.3** To save the route using the same name, click on **OK**. If you want to save the route using a new name of up to 25 characters, then click on **OK**. If you do not want to save your changes, click on **Cancel**.

In this case you can change a selected waypoint by changing the *Radius* or the *label* (see **Step 3.1**).
(4) Option button Route: Insert Before selected

To insert a waypoint before an existing waypoint, first select the existing waypoint, then enter the new waypoint. ECDIS redraws the route to include the inserted waypoint.

Step 4.1 Position the cursor over the waypoint that will follow the inserted waypoint and click [Left] button or directly select the waypoint in the waypoint list box.
Position the crosshairs at the location for the new waypoint and click [Left] button.
The waypoint is inserted and the route is redrawn.
(5) **Option button Route: Delete selected**

Use the Delete feature of the Edit Route command to remove waypoints from a route.

**Step 5.1** Using the target cursor
- Position the cursor over the waypoint you want to delete and click on [Left] button. The waypoint is removed.

or Using the waypoint list in the dialog box.
- Click on the waypoint you want to delete, click on the middle button, the pop up window appears, select *Delete Selected Waypoint*. The waypoint is removed.

**Step 5.2** Select the OK button, if the route changing is finished.
- The Save Route dialogue box appears displaying the name of the route.

**Step 5.3** To save the route using the same name, click on OK. If you want to save the route using a new name of up to 25 characters, then click on OK. If you do not want to save your changes, click on Cancel.

(6) **Option button Route: Reverse**

If you are using the Track Control command and you begin to make changes to a route (the *Edit Route* dialog box is opened), ECDIS automatically switches to manual steering. Once you have made the changes, you must reactivate track control (chapter 8.2.1.3). The Edit Route command offers a very helpful feature that allows you to reverse the order of waypoints in a route. Use this feature when you want to make a return trip following the same route.

**Step 6.1** Click on Reverse. The order of the waypoints in the list box is reversed.

**Step 6.2** Select the OK button, if the route changing is finished.
- The Save Route dialog box.

**Step 6.3** To save the route using the same name, click on OK. If you want to save the route using a new name of up to 25 characters, then click on OK. If you do not want to save your changes, click on Cancel.
(7) XTD limit

**Cross-Track error** (Figure: 8-10)

**Step 7.1** To enter a cross-track error, click in the XTD limit text box and enter the cross-track in [m].

Click on Set to make the change.

The fairlanes on the display will be adjusted according to the cross-track limit settings.

This XTD limit is applied only to Track legs which do not have an individual XTD Limit set and shown with a "*" character preceeding the XTD leg values. Individual XTD values will be shown without any prefix characters.

In order to set XTD Limits individually, click into the XTD field for a waypoint and edit the XTD Limit for the Track Leg leading to this waypoint.

Figure: 8-10 Enter a Cross-Track error

(8) Compact Display

The layout of the Editor dialog may be switched to Compact or back to Expand depending on current needs. In Compact layout the dialog is shown with a limited set of controls requiring minimum screen space (Figure: 8-11), while in Expand layout all controls are shown with standard dialog size.
Step 8.1  Click on Compact. The dialog layout is switched to Compact layout.

Step 8.2  Click on Expand. The dialog layout is switched back to Expand layout.

**NOTE**
Compact layout is not supported during Track Control or Route Monitoring. Compact layout is disabled when in voyage mode.

![Compact Layout Figure](image.png)

Figure: 8–11 Compact Layout

(9)  **Voyage Mode**

In Voyage mode the route is timely planned by setting speed and ETA (estimated time of arrival) fixes. Any changes to speed or ETA items will recalculate other dependent variable speed and ETA values for the route. Any value change will also fix that value (showing it in amber color), disabling it for further changes. Selected value fixes may be removed by context menu (see chapter 8.2.1.2 (13)).

The edit controls for speed and ETA are limited to reasonable min. and max. values depending on neighbor fixed ETA values and the overall ship configuration (i.e. max. Vessel speed). In very rare situations you may get a warning message (Figure: 8–12) when conflicting time conditions exist – in that case speed and/or ETA must be changed to correct the problem.
Voyage mode is activated and deactivated by pressing the Voyage button. The waypoint list layout is then changed accordingly.

In **Standard** mode the following waypoint list columns are shown with the route-position disabled and all other columns enabled:

<table>
<thead>
<tr>
<th>#</th>
<th>position in the route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label</td>
<td>label</td>
</tr>
<tr>
<td>Latitude</td>
<td>latitude</td>
</tr>
<tr>
<td>Longitude</td>
<td>longitude</td>
</tr>
<tr>
<td>Rad</td>
<td>turn radius</td>
</tr>
<tr>
<td>XTD</td>
<td>cross track limit, approaching that waypoint</td>
</tr>
<tr>
<td>Spd</td>
<td>planned speed, approaching that waypoint</td>
</tr>
</tbody>
</table>

In **Voyage** mode the following waypoint list columns are shown (see Figure: 8–13) with all columns disabled except enabled speed and ETA columns:

<table>
<thead>
<tr>
<th>#</th>
<th>position in the route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label</td>
<td>label</td>
</tr>
<tr>
<td>Latitude</td>
<td>latitude</td>
</tr>
<tr>
<td>Longitude</td>
<td>longitude</td>
</tr>
<tr>
<td>Spd</td>
<td>planned speed, approaching that waypoint</td>
</tr>
<tr>
<td>ETA</td>
<td>estimated time of arrival for that waypoint</td>
</tr>
<tr>
<td>Time</td>
<td>show options: (a) TTG, (b) Total Time, (c) Time on Leg</td>
</tr>
</tbody>
</table>
To set and fix a speed or ETA value, double-click the field in the waypoint list and enter the desired value, other dependent speed and ETA values will be recalculated.

To remove a speed or ETA fix, press the middle button on a waypoint and select Remove... fix for Selected Waypoint (see chapter 8.2.1.2 (13)).

To list the current voyage click List button. The list dialog is shown (Figure: 8–14) with applied voyage filter (all or fixed ETA's only). Fixed speed and ETA values are marked with an appended 'F' character. All time options are shown with TTG, Total Time and Time on Leg columns.

**NOTE**

Time on Leg is never shown when the filter ‘fixed ETA's only’ (Figure: 8–15) is activated.
When finished with voyage changes, press the Voyage button again to leave voyage mode.
(10) **Undo / Redo**

The Editor keeps track of all route changing operations. The Undo option will revert to the last saved route state and the Redo option will re-do the last route changing operation.

Up to 20 latest route changes are saved (see ECDIS configuration).

*Step 10.1* Click on *Undo*. The last change operation is undone.

*Step 10.2* Click on *Redo*. The last change operation is re-done.

(11) **Datum Conv**

Option button Route: **Num. Extend** selected

Enter coordinates found on paper charts with different datum (not WGS 84).

When entering waypoints by specifying coordinates, the waypoints are always converted to WGS 1984 coordinates. You may choose a different Datum when entering coordinates.

```
NOTE
The datum conversion is only a display. It will not change the waypoint’s coordinates. The stored waypoints remain unchanged in WSG 1984 coordinates.
```

Procedure: (e.g. using the pop up window per cursor)

*Step 11.1* Place the cursor on a waypoint and click on middle button. The pop up window appears.

*Step 11.2* Select Edit Primary Route entry.

*Step 11.3* Select the action point Num. Extend.
**Step 11.4** Click the Datum Conv. Button and select the corresponding datum from the opening datum list, click Ok.

**Step 11.5** Select existing waypoint in the waypoint list box.

**Step 11.6** Enter waypoint coordinates in the Datum Latitude/Longitude fields, and click on Convert. The coordinates will be converted and filled automatically in the Lat/Lon of the selected waypoint.

**Step 11.7** Click on Ok. The Save Route dialog box appears.

**Step 11.8** To save the route, type a name of up to 25 characters in the text box, then click on OK. If you do not want to save the route, click on Cancel.

Figure: 8–16 Enter different Datum
(12) Great Circle Navigation

ECDIS provides a feature that allows you to navigate great circle routes. Whenever you change the route that 2 neighbor waypoints exceed 200 NM distance from each other, ECDIS prompts you with the following dialog:

![Intermediate Waypoints dialog box](Figure: 8–17)

Two sequential dialog activations are possible for a single route change operation.

In any case you should inspect the actual route list selection to see between which 2 neighbor waypoints the intermediate waypoints will be added. Select Great Circle or Rhumb line, select the requested count and click Yes to continue, click No to bypass this single dialog or click Cancel to abort all dialogs (i.e. undo all changes).

**NOTE**

An explicit delete waypoint operation will not activate the Intermediate Waypoints dialog box.

**NOTE**

To add intermediate waypoints between 2 neighbor waypoints (which have at least 200NM distance), select both waypoints in the waypoint list, click on middle button, in the pop up window select *Create Intermediate Waypoints* (Figure: 8–18).
Simulate a Great Circle Route

If you want to build a great circle route, you will need to enter the number of intermediate points to create the route (Figure: 8–19). These points create a curved great circle route.

![Figure: 8–18 Add Intermediate Waypoints](image1)

![Figure: 8–19 Rhumb Line Vs. a Great Circle Route](image2)
(13) List Context Operations

Depending on current operating mode (standard, voyage) a number of list context actions are available. Depending on the currently selected list entries useless actions are not shown (for exp: do not show an action to fix an ETA which is already fixed).

<table>
<thead>
<tr>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delete Selected Waypoints</td>
</tr>
<tr>
<td>Set Selected Waypoints to 0.20 nm Radius</td>
</tr>
<tr>
<td>Set Selected Waypoints to 400 m XTD</td>
</tr>
<tr>
<td>Set Selected Waypoints to default XTD</td>
</tr>
<tr>
<td>Set Selected Waypoints to 19.0 km Speed</td>
</tr>
<tr>
<td>Set Selected Waypoints to equal properties</td>
</tr>
<tr>
<td>Create Intermediate Waypoints</td>
</tr>
<tr>
<td>Save Selected Waypoints</td>
</tr>
<tr>
<td>Select All Waypoints</td>
</tr>
<tr>
<td>Check Route</td>
</tr>
<tr>
<td>Cancel</td>
</tr>
</tbody>
</table>

Figure: 8-20 Standard Mode Context Actions

In **Standard Mode** the waypoint properties (radius, XTD, speed) may be set simultaneously, selected waypoints may be deleted, all waypoints may be selected, a route check operation may be triggered, intermediate waypoints may be added and consecutive selected waypoints may be saved as a new route.

To trigger a context action, press the middle button on a single selected waypoint or on a waypoint which is part of a multi-selection, and

- Select "Delete Selected Waypoints" to delete waypoints
- Select "Set Selected Waypoints to ...Radius" to set radius values
- Select "Set Selected Waypoints to ...XTD" to set XTD values
- Select "Set Selected Waypoints to default XTD" to set XTD values (default)
- Select "Set Selected Waypoints to ...Speed" to set speed values
- Select "Set Selected Waypoints to equal properties" to set all 3 values
- Select "Select all Waypoints" to select all entries
- Select "Check Route" to trigger a check operation
- Select "Create Intermediate Waypoints" to add intermediate entries
Select "Save selected Waypoints" to save entries

Remove ETA and Speed fixes for Selected WayPoints
Remove ETA fixes for Selected WayPoints
Remove Speed fixes for Selected WayPoints

Fix ETA and Speed for Selected WayPoints
Fix ETA for Selected WayPoints
Fix Speed for Selected WayPoints

Set Selected WayPoints to 10.0 km/h Speed (fixed)

Show fixed ETA’s only
Show Total Time
Show Time on Leg

Delete Voyage
Select All Waypoints
Check Route
Cancel

Figure: 8–21 Voyage Mode Context Actions

In Voyage Mode the waypoint properties (speed, speed-is-fixed, ETA-is-fixed) may be set simultaneously, all waypoints may be selected, a route check operation may be triggered, the ETA display mode may be set (all ETA's, fixed ETA's only), the Time column display mode may be set (TTG, Total Time, Time on Leg) and the voyage may be deleted.

Select "Set Selected Waypoints to ...Speed (fixed)" to set speed values (fixed)
Select "Set All Waypoints to ...Speed (fixed)" to set speed values (fixed)
Select "Select all Waypoints" to select all entries
Select "Check Route" to trigger a check operation
Select "Fix ETA and Speed for Selected Waypoints" to set ETA and Speed fixes
Select "Fix ETA for Selected Waypoints" to set ETA fixes
Select "Fix Speed for Selected Waypoints" to set Speed fixes
Select "Remove ETA and Speed fixes for Selected Waypoints" to remove ETA and Speed fixes
Select "Remove ETA fixes for Selected Waypoints" to remove ETA fixes
Select "Remove Speed fixes for Selected Waypoints" to remove Speed fixes
Select "Show fixed ETA's only" to show fixed ETA entries only
Select "Show all ETA's" to show all entries
Select "Show TTG" to show TTG values
Select "Show Total Time" to show Total Time values
Select "Show Time on Leg" to show Time on Leg values
Select "Delete Voyage" to delete the voyage

8.2.1.3 If Track Control is active

If the route modifications are finished, the modified route has to be activated by the Activate button. The text field at the bottom of the dialog box (Information) displays corresponding messages.

Figure: 8-22 Change Primary Route (Track Control active)
8.2.2 Automatic Route Planning and Port Information (Option)

The ECDIS offers a function for automatic route planning. The Automatic route planning is only available if the Jeppesen (C-MAP) database "Professional+" is installed and has a valid license. This database provides information about more than 5000 ports, certain passages and the routing network.

**NOTE**

The available ports and passages as well as the created routes may vary dependant on the version of the installed "Professional+" database

The route will be created as a new secondary route. The route can be saved and reloaded as any other manually created route.

8.2.2.1 Planning a Route

In this case the route start and destination location can be planned via a list or via a cursor positioning in the chart.

Following combinations are possible:
- with the Add port button (via a list) only or
- by using the Add port button (via a list) and the Click Cursor button or
- by using the Click Cursor button only

*Click Cursor* means one or both of these points can be entered via cursor in the chart.

In this case the system will change the start and destination location to the nearest suitable position.

This position information displays in the dialog box.
Procedure: (Figure: 8-23)

**Step 1** Select *Automatic Route Planning/Port Information* from the *Nav Tools* menu. The dialog box appears.

**Step 2** Select the desired start port in the list /alternative press *Click Cursor*. Position the cursor on the port name /alternative on the chart position. Then press the *Add Port* button /alternative press left trackball key.

For further port details.

Position the cursor on the port name and press the middle trackball key, a port information window appears (Figure: 8-23).

Center the chart

Position the cursor on the port name and press the left trackball key twice. This will center the chart on the corresponding port.

**Step 3** Select the desired destination port (as *Step 2* describes).

**Step 4** Select whether *Inshore Traffic Zones* and Rivers shall be considered for route planning.

**Step 5** Adjust the *Draft*, the default turning *Radius*, the desired speed and the *XTD limit*.

**Step 6** Special application buttons.

The button *Reverse* provides the possibility to swap the start end destination.

The button *Remove* provides to remove the start or destination port in the dialog box for a new entry.

Select the desired start or destination port in the dialog box and press the *Remove* button.

**Step 7** Press the *Calculate* button, a route description displays in the dialog window from the dialog box.

If there is already a secondary route, a confirmation prompt for clearing the existing secondary route will be displayed. If the existing secondary route has not been saved, you get the choice to save the route now.
Figure: 8-23 Automatic Route Planning/Port Information
8.2.2.2 Planning with certain Passages

Certain passages can be excluded from automatic route planning.

Procedure: (Figure: 8-23)

Step 1  Press the Passages button to show a list of all available passages. By default all passages are enabled. Clear the according check marks to disable passages and press the Apply button. The new passage status will be used for the next route calculation.

Position the cursor on a passage and press the middle trackball key twice.

This will center the chart on the corresponding port.

NOTE

It might happen, that some turns (e.g. in canals or port entries) need a smaller turning radius than the given default turning radius, in this case the turning radius will be reduced adequately on the relevant turns and an information is provided in the status area of the window.

In some cases it might be possible that the route can be created but it will not be possible to edit the route afterwards. The reason is, that in some port entries and narrow passages the waypoints are located too densely to allow modifications.

If the system can not create a route between two locations, this may have one of the following causes:

- Either a port or a part of the route is too shallow for the given draft.
- The route would contain a too sharp turn for a valid route.
- All possible passages are disabled.

Possible solutions:

- Select a manually entered start or end position outside the port.
- Verify the given draft.
- Enable Inshore Zones and rivers if possible
- Enable required passages.
Step 2  Press the Calculate button, a route description displays in the dialog window from the dialog box.
If there is already a secondary route, a confirmation prompt for clearing the existing secondary route will be displayed. If the existing secondary route has not been saved, you get the choice to save the route now.

Figure: 8-24 List of all available passages
8.2.3 Route Manager

Figure: 8–25 Route Manager dialog box

When you activate the Route Manager, a list of all known routes is shown in alphabetical order. A short status information is shown dependent on currently selected routes (i.e. total routes available, selected route count, statistic values for the single selected route like Waypoint Count and Last Edited).

Because routes are independent of plots, you can handle any route while any plot is open.

8.2.3.1 Open

The Open as Primary and Open as Secondary commands allow you to load a route as primary or secondary route.
NOTE
When you open a route, ECDIS draws fairlanes and a planned track (dashed) between the waypoints. Use the Track Control command to begin navigating to waypoint (see Activating Track Control (chapter 8.2.12)).

Procedure:

Step 1 Select Route Manager from the Routes menu.
Step 2 Click on the name of the route you want to open.
Step 3 Click on either Open as Primary or Open as Secondary button.
Option Enable Auto Show Route to automatically show a loaded route on chart.

8.2.3.2 Delete

The Delete command allows you to delete routes from the route list that you no longer need. Once a route is deleted, it cannot be retrieved.

Procedure:

Step 1 Select Route Manager from the Routes menu.
Step 2 Click on the name(s) of the route(s) you want to delete.
Click on Delete button. The route(s) is/are deleted from the route list and the list box.
8.2.3.3 Export

The Export Route command allows you to save routes on a USB-Stick, CD or DVD. Available formats are Raytheon-Binary, CSV, GPX, INI and NMEA.

Procedure:

Step 1 Select Route Manager from the Routes menu.
Step 2 Select the drive on which to export the routes.
Step 3 Click on the name(s) of the route(s) you want to export. Click on Export button .
Step 4 Select a format from the popup menu (Figure: 8-26) (the available formats depend on ECDIS configuration). The selected routes are exported using the selected format and written to the selected drive.

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECDIS Route</td>
</tr>
<tr>
<td>CSV</td>
</tr>
<tr>
<td>GPX</td>
</tr>
<tr>
<td>INI</td>
</tr>
<tr>
<td>NMEA</td>
</tr>
<tr>
<td>Cancel</td>
</tr>
</tbody>
</table>

Figure: 8-26 Formats
8.2.3.4 Import

The Import Route command allows you to import routes from a USB-Stick, CD or DVD. The Raytheon-Binary format is supported only. You can only import routes which have been exported with a compatible software version.

**Procedure:** (Figure: 8-27)

*Step 1* Select *Route Manager* from the Routes menu.
*Step 2* Select the drive from which to import the routes.
*Step 3* Click on *Import* button. Select file(s) to import.
*Step 4* Click on *Import from* button the route file(s) is (are) imported from the selected drive.

![Import Routes dialog box](image)

Figure: 8–27 Import Routes dialog box
8.2.3.5 Protect / Unprotect

The Protect Route command allows you to protect routes against accidental deletion and content changes. The Unprotect Route command allows you to unprotect previously protected file(s).

Procedure:

Step 1 Select Route Manager from the Routes menu.
Step 2 Click on the route name(s) you want to protect or unprotect.
Step 3 Click on Protect or Unprotect button (the button inscription is Protect or Unprotect depending on the protect state of the selected files). The selected routes are protected or unprotected depending on the chosen operation.

8.2.4 Toggle Routes

The menu function Toggle Routes allows quick switching between a primary and a secondary route.
For this action, both routes must be defined within the same part of the sea chart.

Procedure: (Figure: 8-28)

Step 1 Select Open Route from the Routes menu.
Select Toggle Routes. Route priority changes at once.
The Primary Route is shown in red thick dashed line
The Secondary Route is shown in red thin dashed lines.
Step 2  For further Secondary Route information place the Cursor on a 
waypoint and click the middle button. 
Select List Secondary Route ....  
The following dialog appears

NOTE
The List Route dialog box appears confirming average ship's speed.  
ECDIS automatically calculates this for you, but you may enter a 
different speed if you wish to.

Step 3  Select your planned speed for the route legs or for the whole route.

Step 4  Click on OK when done.  
(For detailed Information (chapter 8.2.7))

Figure: 8–28  Toggle Routes

Figure: 8–29  List Route
### Route List: Figure 8-30

#### Step 5

Select **Close** when you’ve finished viewing the route list.
8.2.5 Saving Routes (Primary or Secondary)

The Save Route command allows you to store a route in the route list so that you can use it again.

When you choose the Save Route command, the system will check the route for obstacles or depths shallower than the depth defined by the ship’s loading conditions (Ship Info command/Integration menu). If a problem is foreseen relative to waypoint and track leg, a message box appears informing that the route intersects a restricted area.

Procedure: (Figure: 8-31)

Step 1  Select Open Route from the Routes menu.
        Select Save Routes.
        The Save Route dialog box appears with the current route name displayed in the text box. If you have not saved this route before, the box is empty.

Step 2  Click in the text box, and enter a name for the route. If you enter a name which already exists in the route list, ECDIS asks if you wish to overwrite the route.
        Click on Yes to overwrite, or No to change the name.

Figure: 8-31  Save Route dialog box
8.2.6 Show Route (Primary or Secondary)

The Show Route command centers the display on either the active waypoint of the open route, or if there is no active waypoint, the first waypoint in the route.

Procedure:

*Step 1* Select Open Route from the Routes menu.
Select Show Route.
The display is centered on either the active waypoint or first waypoint in the route.

8.2.7 List Route (Primary or Secondary)

The List Route command enables you to display information about the open route. When you select the command, TextView opens and displays information about your route (chapter 8.2.4, Step 3).

![Figure: 8-32 Listing Waypoints using TextView](image-url)
### Table 8-2 Waypoint List Column Definitions

<table>
<thead>
<tr>
<th>Column</th>
<th>Contains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waypoint Num</td>
<td>The waypoints numerical position in the route.</td>
</tr>
<tr>
<td>Waypoint Label</td>
<td>Waypoints label.</td>
</tr>
<tr>
<td>Latitude</td>
<td>Waypoints latitude.</td>
</tr>
<tr>
<td>Brg Next</td>
<td>Bearing from that waypoint to the next waypoint.</td>
</tr>
<tr>
<td>Dist. Next</td>
<td>Distance between that waypoint and the next waypoint.</td>
</tr>
<tr>
<td>Dist. Made</td>
<td>Distance traveled so far. This is continually updated.</td>
</tr>
<tr>
<td>Dist. to Go</td>
<td>The route distance to the last waypoint in the route from the current ship position.</td>
</tr>
<tr>
<td>Rad. [nm]</td>
<td>Turn radius at that waypoint</td>
</tr>
<tr>
<td>XTD [m]</td>
<td>Cross Track Limit approaching to that waypoint</td>
</tr>
<tr>
<td>Plan Spd</td>
<td>Planned speed for the route leg (e.g. from waypoint 1 to waypoint 2)</td>
</tr>
<tr>
<td>TTG</td>
<td>Time to Go; the time needed at the current speed to reach the next waypoint.</td>
</tr>
</tbody>
</table>

At the bottom of the window, ECDIS displays the current ship’s position and the bearing and distance to the active waypoint (when available).

An asterisk marks the active waypoint (when available).
8.2.8 Reviewing Route Check results

Routes are automatically checked when they are opened or edited. Routes may also be checked explicitly using the Routes - Check Route... menu command (chapter 8.2.17).

The results of the latest route check can be reviewed with this menu command. The results are displayed in a window similar to the Object Information window. The check results can either be ordered by Object Types (e.g. Depth Area, Land Area, Restricted Area, Wreck, ...) or by Waypoint/Track Leg.

![Route Check Results](image)

Figure: 8–33 Route Check Results (ordered by waypoints)
On the right hand side of the window the detail information for the selected object will be displayed. The selected object will also be highlighted on the chart. By double clicking on an object the chart will be centered on the object.

**8.2.9 Clearing Routes from the Display**

When you have finished navigating a route, you can clear it from the display using the Clear Route command. Be sure to save a new or updated route before using this command. This command does not delete the route from the route list, it only removes the route from the display.

**Procedure: (chapter 8.2.1.1)**
8.2.10 Sending and Displaying ECDIS objects and Route on the Radar

ECDIS allows you to send and display objects on selected radars. ECDIS is compatible with any device whose I/O ports are according to designed NMEA 0183.

8.2.10.1 Send to Radar

Procedure: (Figure: 8-35)

*Step 1* Click with the middle button on the object you want to send to your radar (e.g. Depth contour); then press *Send to Radar* from the dialog box which appears.

**NOTE**

The object information is sent to the radar. If the *Send to Radar* command is not enabled, please check to make sure that the radar is the active radar in the ARPA Radar Tracking dialog box (Radar Tracking ON). Please see *Integrating an ARPA Radar* (chapter 12.1.3).
8.2.10.2 Send Route to Radar

The Send Route to Radar function is used for the Primary Route.

Route Monitoring can be activated if you want to transfer a Primary Route to the connected radar display.
This is an automatic function without any pop up window information.
8.2.11 Route Monitoring

*Route Monitoring* can be activated if you want to follow a route in manual or leading control, but also want to have the information provided in track control mode, i.e. exceeding cross track limits, approaching a waypoint.

The "Route Monitoring" function is used for a loaded route.

Any waypoint of the route can be selected by using the arrow buttons to switch between waypoints or directly by clicking a waypoint by cursor.

Window “Select Active Waypoint” displays position coordinates of the selected waypoint.

If you want to approach the first waypoint of a route a thin dashed line is drawn from ship’s symbol to the waypoint, provided with information for planned speed and course to that waypoint (Figure: 8–36).

If the ship is on the track, the thin line is drawn from the current position of the ship to the approached waypoint on the track.

The current track leg is also provided with information for planned speed and course.
Procedure: (Figure: 8-36)

**Step 1** Select *Open Route* from the Routes menu.
Select *Route Monitoring*.
(Alternative selection, place the Target Cursor on a waypoint from a Route and click the middle button.
Select *Route Monitoring* from the menu box which appears)

**Step 2** Select the desired waypoint per left or right arrow button or per target cursor.

Figure: 8–36       Route Monitoring
8.2.12 Track Control

NOTE
Track Control is not an ECDIS function. To activate this function an AUTOPILOT System has to be connected. For detailed information ask Raytheon Marine.

If an Autopilot Remote Control Panel (ARCP Type 102-897, see additional description no. 3307) is attached the operation is carried out via this panel!

Once a route has been established, the Track Control command provides central access to necessary navigation functions. You can use the Steer to Track dialog box to:

- Activate track control
- Stop track control
- Reactivate track control

The waypoint you are navigating to is called the “active” waypoint. ECDIS does not select an active waypoint until the Track Control command is selected. Once the dialog box is open, it selects the first waypoint in the route as the active waypoint.

Once an active waypoint has been selected, ECDIS circles the active waypoint for which the waypoint alarm will be given, draws predicted and planned turning arcs, as well as a dotted course line (planned track) between the waypoint and your ship. Once you reach the active waypoint, ECDIS automatically makes the next waypoint on the route the active waypoint and automatically draws the new course line, and turning arcs. Even if you cut a corner off your route, or skip a waypoint, ECDIS automatically makes the next waypoint the active one.

NOTE
If you want the Planned and Predicted Turning arc to be the same, you must adjust either your rate of turn or the ship’s speed (Autopilot dialog box/Integration (chapter 12.1.5)).
8.2.12.1 Information Panel NAV - Route Description -

You will find the Information Panel very helpful while navigating. The NAV panel of ECDIS uses the TO WPT box to display information about the active waypoint you are approaching. It provides you with the cross-track deviation, the bearing, the distance, the position and the estimated time of arrival (ETA) for the waypoint (for detailed panel information (chapter 2.7)).

![Figure: 8-37 Information Panel NAV - Route Description -]

8.2.12.2 Information TRACK - Route Description -

The TRACK panel contains the following information.

**To Waypoint:**
The label (name) of the active waypoint. The active waypoints location. The active waypoints distance and track course and the time to go at the ship’s current speed.

**Next Waypoint:**
The label (name) of the waypoint following the active waypoint. The position of the next waypoints distance from the ship, bearing from the active waypoint and the estimated time to go at the ship’s current speed (for detailed information (chapter 2.7)).

![Figure: 8-38 Information TRACK - Route Description -]
8.2.12.3 Activating Track Control

NOTE
Track Control is not an ECDIS function. To activate this function an AUTOPILOT System has to be connected.
For detailed information ask Raytheon Anschütz.

When you open the Steer to Track dialog box after creating or opening a route, ECDIS automatically selects the first valid waypoint in the route as the active waypoint. If you want to navigate to a different waypoint, you can do so by using the arrow keys. When you select the new waypoint, ECDIS checks to make sure it is a valid course line, then it circles the waypoint, redraws the course line, and updates the Information Panel. If it is not a valid course line, then ECDIS grays the dialog box, except the Select Active Waypoint arrow buttons, until a valid waypoint is selected.

Selecting an active waypoint is very useful when you are navigating a long route. For example, suppose you are navigating a route from Seattle to Pusan and decide to stop in Prince Rupert. When you are ready to continue on to Pusan, open your route again, and then using the Track Control command, you can reassign the active waypoint and continue on the route.

Procedure: (Figure: 8-39)

Step 1 Select Track Control from the Routes menu.
(Alternative selection, place the Target Cursor on a waypoint and click the middle button.
Select Track Control from the menu box which appears)

Step 2 Move the cursor over the waypoint to which you want to navigate and click, or use the left and right arrow keys at the top left hand corner of the dialog box.

Step 3 Select Text Point: Go to Waypoint.

Step 4 Click on OK. Track Control is activated
Step 2 indicated only when NP20 is installed.

Figure: 8-39 Activating Track Control
8.2.12.4 Stopping Track Control

If you want to depart from the track or interrupt track control in case of emergency:

**Procedure:** (Figure: 8-40)

*Step 1* Select *Track Control* from the Routes menu.
(Alternative selection, place the Target Cursor on a waypoint and click the middle button.
Select *Track Control* from the menu box which appears)

*Step 2* Move the cursor over the waypoint to which you want to navigate and click, or use the left and right arrow keys at the top left hand corner of the dialog box.

The following message will appear

![Track Steering]

*Do you want to take ECDIS out of Track Steering?*

[Yes] [No]

Figure: 8-40 Stopping Track Control Message Box

*Step 3* Click on Yes. Track control is stopped.
8.2.12.5 Reactivating Track Control

When you - after an interruption - are ready to reactivate track control, you can open the Steer to Track dialog box and select a waypoint in the route as the active waypoint you want to navigate to.

**Procedure:** (Figure: 8–41)

**Step 1** Select *Track Control* from the Routes menu.
(Alternative selection, place the Target Cursor on a waypoint and click the middle button.
Select *Track Control* from the menu box which appears)

**Step 2** Move the cursor over the waypoint to which you want to navigate and click, or use the left and right arrow keys at the top left hand corner of the dialog box.
The following message will appear

![Steer to Track dialog box](image)

**Step 3** Click on *OK*. Track Control is reactivated.
8.2.13 ETA Calculation

With this function the parameters for the ETA calculation can be set.

There are two ways to calculate the ETA:
- Based on the current speed for the whole route from current ship’s position via the TO Waypoint to the end of the route.
- Based on the planned speed for all Route legs except for the distance from current ship’s position to the TO Waypoint and for all Route legs for which no planned speed is defined.

Optionally an Interim ETA at a selectable waypoint may be calculated.

The calculated ETA is displayed on certain Infopanels.
8.2.14 Distance-To-Run / Planned Position

**Distance-To-Run**
From this menu function a Distance-To-Run Interval can be defined. It is appropriate to zoom out the chart such that the complete route is visible.

**Procedure:** (Figure: 8-44)

*Step 1* Select *Distance-To-Run* from the Routes menu. The Distance-To-Run dialog box appears.

*Step 2* Adjust the desired width of the interval either by typing it in or via the spinners.

*Step 3* If the *Enabled* box is marked click on *OK*, corresponding labels are displayed along the route indicating distances according to selected interval.

![Distance-To-Run Enabled](image)

Figure: 8-44 Distance-To-Run Enabled
Planned Position
This tool can be directly related to the Distance-To-Run function. Planned Position will reasonably only be performed for the Track Control or Route Monitoring. It is appropriate to zoom out the chart such that the complete route is visible.

Procedure: (Figure: 8-45)

Step 1 Select Distance-To-Run.. from the Routes menu. The Distance-To-Run dialog box appears.

Step 2 The adjusted range of D-To-R Intervals is 4 NM (Enabled box is marked).

Step 3 Select the Planned Interval Pos directly by typing in or via the spinner (Enabled box is marked). Click on OK.

Next to this selected point (in this example 80 NM) an info field in form of an ellipse shows time and date for arrival at this point from current position.
Figure: 8–45  Distance-To-Go and Planned Position
8.2.15 Pre-Departure Checklist

The Pre-Departure Checklist allows you to write a individual checklist for e.g. important procedures like *what is to do before leaving the harbour?* This checklist can be stored under a typical name so you can call it up every time.

**Procedure:** (Figure: 8–46)

*Step 1* Select *Pre-Departure Checklist* from the Routes menu. The dialog box appears.
Select a new or an old file (e.g. a new file)
*Step 2* Click on <NEW> if you want to create a new checklist.
Now you can enter your text items.
Step 3 Click on the *Save* button, and save file as e.g. HARBOUR CHECK
Step 4 Click on the Export button to save this list on USB-Stick, CD or DVD.

![Predeparture Checklist](image)

Figure: 8–46   **Pre-Departure Checklist**
8.2.16 Alarms

Using the Navigational Alarms
In connection to Route planning ECDIS provides two alarms to assist you in navigation:
The Waypoint Approach Alarm and the Cross-Track Error Alarm.

Both alarms can be adjusted by the Alarms command, opening the dialog box shown below.

![Alarms dialog box](image)

Figure: 8-47 Alarms dialog box

Procedure: (Figure: 8-48)

Step 1 Select Alarms.. from the Routes menu.
The dialog box appears.

The Waypoint Approach Alarm
The Alarms dialog box allows also to adjust the time at which an alarm is to be given when the ship is approaching the wheel-over-point.
The alarm will be released at the specified time before the vessel will reach the wheel-over-point.
If the ECDIS is used with the Autopilot NP 20.. this time value can be adjusted between 3 and 6 minutes.

Cross-Track Error Alarm
The cross-track error alarm is used to generate a warning message when Own ship’s distance from track (either port or starboard) is exceeding a specific distance. The vessel’s current cross-track error is displayed in the Information Panel.
Cross Track Deviation Limit violation

ECDIS generates an alarm to indicate violation of cross-track limits (the Cross Track Deviation Limit is defined in the Alarms dialog box shown in Figure: 8-48 and can also be set in the Create/Change Route dialog (chapter 8.2.1.2 (7)).

NOTE

ECDIS calculates the current cross-track error as the perpendicular distance between your ship’s position and the intended track.

The cross-track deviation limit establishes the width of the fairlanes and of the vessel’s searchlight. If the cross-track error is set to 0.5 NM, fairlane and searchlight width would be equal to 1NM. Please see "The Ship’s Heading Vector and Anti Grounding Look Ahead", chapter 7.1.3.

When the alarm is triggered, ECDIS displays the message "Warning Cross-track Error greater than value specified".

Figure: 8-48 Cross-track Error
8.2.16.1 Setting the Navigational Alarms

Procedure: (Figure: 8-49)

**Step 1** Select *Alarm* from the Routes menu, the dialog box appears.
(Alternative selection, place the Target Cursor on a waypoint and click the middle button. Select *Alarm* from the menu box which appears. The dialog box appears)

**Step 2** Type the PreWarning time (in minutes) to be released before course change.
The *Cross Track Deviation Limit* text box displays the value (in m) which has been set in the Create/Change Route dialog (chapter 8.2.1.2 (7)).

**Step 3** Click on *OK*

![Alarms dialog box](image)

Figure: 8-49 Alarms dialog box
8.2.17 Check Route

**Check Route** considers the validity of objects limited in time in the sea chart formats CM93/3 and S57.

Objects limited in time are:
- Prohibited Areas
- Own Ships Contours
- Buoys and Beacons.

Check Route is recommended for a check-over of a known route, for example, that has to be sailed on a certain date.

It is possible that known routes were planned with an older chart version. With a Chart Update, new situations can arise. Check Route examines the entire route to that and effect and release alarm messages, if necessary. The individual route sections are to be checked over (chapter 8.2.1.2).

**Procedure:** (Figure: 8–50)

1. **Step 1** Select *Open Route* of the Routes menu, the dialog box appears. Select on the name route name of interest.
2. **Step 2** Click on either *Open* or *Open and Show*.
   (Alternative double click on the route name will also open and display the route)
3. **Step 3** Select *Check Route* of the Routes menu, the dialog box appears. Select a Date and click on *Check Now*.
   The results will be displayed in the alarm window.

(Figure: 8–50)
8.2.18 ECDIS used as Route Server or Route Client (Option)

This functionality is only possible in connection with a navigation system containing at least two ECDIS units. Depending on the system configuration, one ECDIS can be the Route Server or the Route Client.

**Route Server Rights means:**
- The creation, handling and deleting of Primary and Secondary Routes.
- The Primary Route is transferred to the Client ECDIS units and indicated there.
- Track Control can only be activated via the ECDIS having the Route Server Rights.

**Route Client Rights means:**
- The creation, handling and deleting of Secondary routes.
- The Primary Route can be indicated, but not deleted.

**Select Route Server means:**

**Procedure:** (Figure: 8-51)

1. **Step 1** Select *Route Server Rights* of the Routes menu.
   - Within a navigation system, only one ECDIS at a time can adopt the status *Route Server Rights*.
   - The Routes menu changes.
By selecting this route function the Client Status changes to the Server Status.

Figure: 8–51 Changing Route Rights Client to Server
9 NAV TOOLS MENU

9.1 NAV TOOLS MENU COMMANDS

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### Nav Tools Commands

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<td>Allows you to actuate the Magnetic Variation (DNC database)</td>
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9.1.1 Electronic Bearing Line (EBL)

You can use the Free EBL and Fixed EBL commands to draw electronic bearing lines either centered on own ship or at any location on the display. The Fixed EBL command draws an electronic bearing line which centers on own ship’s location. The Free EBL command will allow you to obtain the range and bearing between any two points on the display.

9.1.1.1 Range and Bearing from One Point to Another

Procedure: (Figure: 9-2)

Step 1  Select Free EBL/VRM from the Nav Tools menu or click on the Free EBL button on the toolbar

Step 2  Position the target cursor at the first point of interest, then click the [Left] button.
       This anchors the first (base) point for the electronic bearing line.
       The other end of the line moves with the cursor. In the Cursor box, the range and bearing from one end of the line to the other are displayed. ECDIS updates these values until you stop moving the cursor.

Step 3  Click the [Left] button when you have reached the desired location
Step 4  Press the [Right] button or [Esc] when you're done.
Figure: 9–2  Range and Bearing from One Point to Another
9.1.1.2 Range and Bearing from the Ship to a Displayed Location

Procedure: (Figure: 9-3)

**Step 1** Select Fixed EBL/VRM from the Nav Tools menu or click on the Fixed EBL button on the toolbar.
The anchor point of the EBL is located at the ship’s center.

**Step 2** Position the target cursor at the intended location, then click the [Left] button.
In the Cursor boxes, the range and bearing values at cursor position are displayed.

**Step 3** ECDIS updates these values until you stop moving the cursor and press [Left] button.

**Step 4** Press the [Right] button or [Esc] when you’re done.

Figure: 9-3 Range and Bearing from the Ship to a Displayed Location
9.1.2 Show EBL/VRM Labels

This Function enables/disables the display of Labels on Fixed and Free EBL/VRMs
The Label is displayed outside the VRM near the intersection of EBL and VRM.

Figure: 9–4  EBL/VRM Labels
9.1.3 Rhumb/Great Circle Line

Within this NavTool it is possible to calculate distances of two positions on a Rhumb Line or a Great Circle Line.

Procedure: (Figure: 9-5)

**Step 1** Select *Rhumb/Great Circle Line* from the Nav Tools menu. The dialog box appears.

**Step 2** Enter *Start and End Coordinates*. The bearings and distances are calculated each time one of the coordinates is changed.

**Step 3** Each of the lines may be shown on the chart by selecting the corresponding check box.

![Diagram of Line Tool](image)
9.1.4 Datum Transformation

With this NavTool it is possible to calculate position values (coordinates) for different datums.

Procedure: (Figure: 9-6)

*Step 1* Select Datum Transformation from the Nav Tools menu.
   The dialog box appears.

*Step 2* If you want to change the Source Datum, press the Change button, a library list window appears.
   Select another datum item from the list via cursor.
   Press the OK button.
   
or
   If you want to change the Target Datum, press the Change button, a library list window appears.
   Select another Target item from the list via cursor.
   Press the OK button.

Figure: 9-6 Select a new Source Datum
9.1.5 Cursor Offset

With this NavTool it is possible to calculate the cursor position for different datums.

Procedure: (Figure: 9-7)

- **Step 1** Select *Cursor Offset*... from the *Nav Tools* menu. The dialog box appears.
- **Step 2** If you want to change the *Cursor Offset*, press the *Change* button, a library list window appears. Select another datum item from the list via cursor.
- **Step 3** If *Enable Display* is selected a window next to cursor is showing the position value for the selected datum.

**NOTE**
The cursor field in the Status Bars is still giving cursor position for datum WGS 84.

---

*Figure: 9-7  Cursor Offset*
9.1.6 Position Fix

With this NavTool any position within the chart can be declared to be fix points. The selection can be made with the cursor or manually with the keyboard via the position window *Latitude* and *Longitude*. Every fixed point is given a code via the *Option buttons* that verifies the information source.

**Procedure**: (Figure: 9-8)

1. **Step 1** Select *Position Fix* from the *Nav Tools* menu. The dialog box with several tasks appears.
2. **Step 2** Select *Fix Position Set* from the *Display* menu. Fixed Position dialog box appears. Select the Option button *New*. Select the *Method of fix*.
3. **Step 3** Position the cursor at the position of interest press the [Left] button or fill in the Latitude and Longitude fields via keyboard. Then press the *Accept* button. The *Fix Symbol* appears in chart. Marked with the current fix time and the identification letter for Method of fix.
4. **Step 4** For deleting a Fix Position Symbol you have several conditions
   - Select *Fix Position Delete*, position the cursor at the Fix Position symbol of interest and press the [Left] button
   - Select *Fix Position Delete in View...*, all Fix Position Symbols in this area will be deleted.
9.1.7 Line Of Position

The Lines Of Position (LOP) feature is provided as an aid to the Navigator (terrestrial navigation):

- To determine ship’s location when forced to operate in the Dead Reckoning (DR) mode.

- As a visual check of the Ship’s electronic positioning systems.

Up to 4 Lines of Position (LOP) may be entered. Each of these LOP may be either a Bearing line or a Range Arc.

The ECDIS will store the own ship’s movement data for up to 4 hours for automatic determination of Course Over Ground (COG) and Speed Over Ground (SOG) which will be used for transferring the LOP.

Figure: 9-9 Line Of Position features
1. **Now**  
   Select the Time Of Validity (TOV). Default time reference is UTC. After pressing the NOW button the TOV will be set to the current ships time.

2. **Modify / Add**  
   Is used to confirm a modification of existing Line Of Position or to add a new LOP.

3. **Delete**  
   Deletes an selected entry in the list box.

4. **Deletes All**  
   Deletes All entries in the list box.

5. **Hide All**  
   Turns LOP Display ON or OFF

6. **Error Bounds**  
   If there are known offset error (Gyro error or Radar index error), these errors can be entered in the Error Bound dialog and will be considered automatically in subsequent drawings and calculations for LOP.

7. **Position Fix**  
   The button Position Fix will apply the fix by placing a Position Fix Marker at the calculated (or manually adjusted) position and by setting the Dead Reckoning Position to the resulting current position. The resulting current position is permanently updated and displayed in the Dialog Box and as an indication on the chart.
8. **Save Fix**
   The LOP entries will be saved and can be recalled within 4 hours.

9. **Close**
   Closes the Position Fix dialog box without saving.

10. **List of LOP**
    Individual LOP may be enabled or disabled using the check box in the list.

11. **Mode**
    Mode for selecting a bearing line or a range arc.

**Procedure:** Figure: 9-11

*Step 1* Select *Line Of Position* from the *Nav Tools* menu.
   The dialog box appears.

*Step 2* Click on the *Mode* button.
   Select Bearing or Range.

*Step 3* Place the Cursor over the selected Nav Aid and press [left button].
   The *Latitude / Longitude* values will appear in the Reference Position boxes.
   Enter the sighted Bearing or Range.

*Step 4* Click on the *Add* button.
   The LOP appears in the list box.
   The bearing line or the range displays on the chart.
   For creating the next *Line Of Position* start with *Step 2* again.

*Step 5* Click on the *Position Fix* button to apply the fix.

All selected LOPs, which are used for the fix, are displayed on the chart.
They are labeled with their Bearing or Range and the ToV. Transferred LPO are labeled with “TPL” (Transferred Position Line) additionally.
The fixed will be calculated from the intersection points of the selected LOP.
It might happen that the intersection points are located in two equivalent groups (e.g. as a result of two overlapping range arcs). In this case the user may either select one of these two groups as the most likely position of the ship or add an additional LOP in order to achieve a unique accumulation of intersections for the fix. While the Group selection is displayed, the groups are marked on the chart as well.
9.1.8 Tidal Prediction

The Tidal Prediction is only available, if the Jeppesen (C-Map) “Professional +” database is installed and has a valid license.

With this NavTool it is possible to calculate tidal prediction for more than 7000 tide stations.

Procedure: (Figure: 9-12)

- **Step 1** Select *Tidal Prediction* from the *Nav Tools* menu.
  The dialog box appears.

- **Step 2** Select the desired port area in the list box (1).
  The desired port area can be selected via following buttons:

  - **All Ports**
    Shows all existing Ports (more than 5000 ports). Use the scroll bar for selecting the desired port.
    Position the cursor on the port name or the position of interest and press the [Left] button.
    The Max. High and Min. Low Water tidal appears as a graphical display (2).

  - **Ports in View**
    Shows only the existing Ports for the current chart area.
    By using the *Zoom In* function, the existing Ports in this area appear in the list box.
    Position the cursor on the port name or the position of interest and press the [Left] button.
    The Max. High and Min. Low Water tidal appears as a graphical display (2).

- **Step 3** To change the *Date* (5), use the spinners or fill in the date directly for doing the tidal prediction.
  To change the *Scale Height* (3), use the spinners or fill in the scale height. The graphical display update at once.
  The automatic scale height is “0”.


Check box (4) for showing the Tidal Information Marks on Charts (up to 1 : 500,000 only).

Symbol for the information mark.

Figure: 9-12  Tidal Prediction
9.1.9 Magnetic Variation

If the coefficient of magnetic variation calculation are out of data the following message appears.

The warning message contains an address to get in contact for a new version.

![Warning message image]

Figure: 9-13 Warning message

Procedure:

**Step 1** Select *Magnet Variation* from the Nav Tools menu showing the current Geomagnetic field deflection or select *OK* button from the *Warning message* doing the update (Figure: 9-13).

The dialog box appears.

**Step 2** If you got the Update CD select *Magnet Variation* from the Nav Tools menu again. Insert the CD into the CD/DVD drive.

Click on the *Browser* button and select the location of the Update file.

Click on the *Load* button.

**Step 3** The Update process is finished
Step 1

Step 2

Step 3

Figure: 9-14  Magnetic Variation
10 PLOT LAYER

Plot Layer is a drawing tool allowing manual chart entries to be indicated into an area chosen by the user. The chart entries can be composed of different objects. Each of these objects can be individually designed using the offered attributes Color and Style. Named object entries can be faded in on all sea charts known to the ECDIS (ARCS, CMAP, S57) exactly in the desired position and edited, if needed.

The editing of the desired entries is possible at all times. Entries are automatically saved in the currently active Object Group.

10.1 PLOT LAYER COMMANDS

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Figure: 10-1 Draw Menu

Table 10-1 Overview Draw Menu
10.1.1 Plot Layer Description

Figure: 10–2 Draw Objects

1. **Active Group of Objects** for
   - selecting a named group of chart entries
   - designating a newly named group of chart entries
   - deleting a desired group of chart entries

2. **Edit**
   - Edit is subdivided into following groups:
     - Object - for selecting the display mode
     - Action - for editing objects
     - Color - for the object attribute Color
     - Style - for the object attribute Style

3. **Position**
   - shows the current cursor position during the recording phase.
   - Can be used for entering the position. The position is taken over by clicking on the Accept button.
Info

shows context-related information or
shows the known data of an object group (name, last modified, contents).

How it works

- Info for Object Point selection
  Each point can be marked with a label (font size Small, Middle, Large), Color and Style.
  The labeling can be done:
  - manually (e.g. name)
  - automatically by using the selection mode UTC (Universal Time Clock) or Sequential

- Info for Object Line selection
  A line can be displayed as a line or a circle (check box selection).
  The Line or Circle can be marked in Color and Style.
  In the Circle selection mode, the Radius and the Number of intermediate points will be determined by entering the respective values into an additional dialog box.

- Info for Object Area selection (3 points minimum)
  An area consists of 3 points minimum.
  An area can also be displayed as a circle (1 point). In this selection mode, the Radius and the Number of intermediate points will be determined by entering the respective values into an additional dialog box.

- Info for Object Arrow selection (2 points minimum)
  Each arrow can be marked with a label (font size Small, Middle, Large) Color and Style.
  The labeling can be done:
  - manually (e.g. name), bearing and distance is selectable.
  - automatically via NLT (Not Less Than) or NMT (Not More Than) with bearing. As an example, this functionality can be used to mark the boundaries of safe and unsafe fairways.
Info for Color selection
From the variety of colors offered, RED is suggested as color indicating alarm.

10.1.1.1 Example

Procedure:

Step 1 Select Draw Objects from the Plot Layer menu.
   The dialog box appears.

Step 2 Click on the New Group button. Write down the name e.g. “ANCHOR PLACE”.
   Click on the Add Group button.

Step 3 Select the Object, e.g. Area.
   Select the Color and the Line Style.

Step 4 Placing a new object.
   Place the cursor in this chart area where you want to have the drawing.
   Click on the [Left] button.
   Follow the InfoText.
   If you want to place a second object (same type or another type) under the name “ANCHOR PLACE”, please start with point 2. again.
   (It is possible to Insert the second or more entries later.)
   Click on the “Exit” button.
   The job has been saved under the recording position in the chart.
10.1.2 **Merge Object Groups**

Within this Plot Layer function it is possible to merge at least 2 existing groups to one new group.

The maximum size of the new group is 200 points, 1000 line points, 1000 area points and 100 arrows.

**Procedure:** (Figure: 10-3)

1. **Step 1** Select Merge Object Group from the Plot Layer menu. The dialog box appears.
2. **Step 2** Enter a name in the New Group text box. Select the objects you want to merge. Click on the Merge selected Groups into new Groups button.
3. **Step 4** The new Object Group name appears in the object list attended by a text message in the lower dialog box area.

![Figure: 10-3 Group selection](image-url)
10.1.3 Export Object Groups

The Export Object Groups command allows you to save groups on a USB-Stick.

Procedure: (Figure: 10-4)

Step 1 Select Export Object Group from the Plot Layer menu.
The dialog box appears displaying the names of all the object groups saved in the list.
Step 2 Select a name of the object you want to export.
Step 3 Insert a USB-Stick into USB slot and click on the Export to Floppy button.
The dialog box remains open for you to copy additional objects. Click on Close when you are done.

Figure: 10-4 Export Object dialog box
### 10.1.4 Import Object Groups

The Import Object Groups command allows you to import objects from a USB-Stick. You can only import objects which have been exported by the ECDIS software from Raytheon Anschütz.

**Procedure:** (Figure: 10-5)

1. **Step 1** Select Import Object Group from the Plot Layer menu. The dialog box appears displaying the names of all the object groups saved in the list.
2. **Step 2** Insert a USB-Stick into the USB slot and click on the Import from Floppy button. The dialog box remains open for you to import additional objects. Select a name of the object you want to import.
3. **Step 3** Click on Close when you are done.

---

**Figure: 10-5 Import object dialog box**
11  LOGS MENU

If the ECDIS is in operation the Log function is active. In this case the most relevant ship data or events will be recorded in a Current 24 Hour Log file. This file information can be displayed and exported. The ECDIS saves the last 30 Log files.

The Voyage Recorder automatically retains the ship's past track of the last 14 days.

11.1  LOGS MENU COMMANDS

<table>
<thead>
<tr>
<th>Nav Tools</th>
<th>Plot Layer</th>
<th>Logs</th>
<th>Integration</th>
<th>Help</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current 24 Hour Log...</td>
<td>Manage 24 Hour Log...</td>
<td>Manual 24 Hour Log Entry...</td>
<td>Voyage Recording...</td>
<td></td>
</tr>
</tbody>
</table>

**Figure: 11–1 Logs Menu**

<table>
<thead>
<tr>
<th>Log Commands</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1.1 Current 24 Hour Log</td>
<td>Shows the Current 24 Hour Log displayed in a tabulated dialog box.</td>
</tr>
<tr>
<td>11.1.2 Manage 24 Hour Log</td>
<td>Shows up to 30 previously recorded 24 Hour Logs in a list for viewing separately records.</td>
</tr>
<tr>
<td>11.1.3 Manual 24 Hour Log Entry...</td>
<td>Allows the user to write 24 Hour Log entries such as Text notes, Weather notes, Waves notes, Water Temp. notes and Voyage notes.</td>
</tr>
<tr>
<td>11.2 Voyage Recording...</td>
<td>Shows, hides or deletes recorded tracks.</td>
</tr>
</tbody>
</table>
11.1.1 Current 24 Hour Log

The following events are recorded in the 24 Hour log.

- Alarm
- Warning
- Info (different information events)
- Acknowledge (of Alarm or Warning)
- OwnShip (periodic recording)
- NavDevice (Position Device changed)
- MOB (set and cleared)
- Waypoint (approach to next waypoint during Track Control)
- Text (manual entries)
- Environmental data (manual entries)
- Voyage Start or End (manual entries)

The Columns Date, Depth, VoyDist and Wind and certain Events may be hidden from the 24 Hour Log display by filter settings.

Procedure: (Figure: 11-2)

Step 1  Select Current 24 Hour Log from the Logs menu.
The dialog box appears.
The Current 24 Hour Log is automatically scrolled to the most recent entry at the end.

Figure: 11-2  Current 24 Hour Log box
Command Buttons:

- **Close**: Click on Close to exit the box

- **Print**: Click on Print to print out the 24 Hour Log contents on a separate printer.

- **Export**: Click on Export to create a file (TXT format) with the contents of the Current 24 Hour List in the view. The export will be done on the selected media drive or USB drive attached to the system. Follow the dialog box (Figure: 11-3).

![Export dialog box](image-url)

**Figure: 11-3  Export dialog Box**
Click on Filter. The filter dialog box appears (Figure: 11-4). Select the Column and Event types in the Checkbox you want to see in the 24 Hour Log list box (default settings; all Columns and Events are selected). You may optionally specify a time range for filtering the 24 Hour Log.

If any filtering (Event or Time) is applied, a note Filtered is added to the title bar of the 24 Hour Log list box and an asterisk (*) indicator is displayed on the Filter button.

Figure: 11-4  Filter dialog Box

Click on Cancel to close the dialog box without changing the filter settings.
Click on Ok when you are done.

Click on Refresh. The contents of the Current 24 Hour Log in the view will be refreshed.
11.1.2 Manage 24 Hour Logs

Manage 24 Hour Logs is used to view, export or delete previously recorded 24 Hour Logs. The system stores the 24 Hour Logs of up to a month. The maximum storage period can be configured by a service technician. The 24 Hour Logs are displayed in a list and may be viewed, exported or deleted separately.

Procedure: (Figure: 11-5)

Step 1 Select Manage 24 Hour Log from the Logs menu. The dialog box appears.

![Manage 24 Hour Log dialog box]

Figure: 11-5  Manage 24 Hour Log dialog box

Command Buttons:

- **View**
  - Click on View to display the selected 24 Hour Log.
  - The display of a complete previous 24 Hour Log looks similar to the display of the Current 24 Hour Log, except that there is no Refresh button.

- **Export**
  - Click on Export to create a file (TXT format) with the selected previous 24 Hour Log.
  - The export will be done on the selected media drive or USB
drive attached to the system.
Follow the dialog box (Figure: 11-6).

**NOTE**
After exporting, the user may choose to delete the exported logs.

![Export dialog Box](image)

**Figure: 11-6  Export dialog Box**

**Delete**
Click on Delete to delete a selected 24 Hour Log entry.

**NOTE**
The 24 Hour Logs of the current and the previous day are protected and may not be deleted. The protected 24Hour Logs are displayed in dark red. A larger number of protected 24Hour-Logs may be configured.

**Close**
Click on Close to exit the box.
11.1.3 Manual Log Entries

The dialog allows to enter three types of log:

- Text (free text or user defined template text)
- Environment
- Voyage (Start or End of a voyage)

All manual 24 Hour Log entries will be formatted as text in a separate row of the Current 24 Hour Log. All other columns (e.g. Time, Position, Heading, ....) will be filled automatically with the current values.

- Text

Procedure: (Figure: 11–7)

Step 1 Select event type Text.
Step 2 Enter the text.
Step 3 The text string will be formatted as a text in a separate row of the Current 24 Hour Log dialog box.

Figure: 11–7 Text dialog box
Defining text templates for recurring situations.

**Procedure: (Figure: 11-8)**

Step 1  Select the button Edit to define user text templates.

Step 2  Click the button New to enter user text.
    Enter user text (e.g. Hallo World!).

Step 3  Click the button Apply.

Step 4  Click the button Close to store the user text.

Now the defined text templates are choisable to enter log text.

**Figure: 11-8 Edit Log Text Blocks**
• Environment Entry

**Procedure:** (Figure: 11–9)

Step 1  Select event type Environment
Step 2  Enter the values for Air Temperature, Air Pressure, Water Temperature, Wave Height, Wave Direction, Visibility, Coverage. The ‘C’ button will clear the corresponding field.
Step 3  The text string will be formatted as a text in a separate row of the Current 24 Hour Log dialog box.

![Figure: 11–9 Manual 24 Hour Log Entry](image)
• Voyage (Start / End)

A Start Voyage entry will reset the voyage distance value and start measuring the voyage distance.

**Procedure:**  (Figure: 11–10)

Step 1  Select event type Voyage.
Step 2  Select Start Voyage or Select End Voyage
  An End Voyage entry will stop measuring the voyage distance.
Step 3  Enter the value for Initial Voyage Dist.
Step 4  The text string will be formatted as a text in a separate row of the Current 24 Hour Log dialog box.

![Voyage dialog box](image)
11.1.4 Voyage Recording

The Voyage Recorder automatically retains the ship’s past track of the last 14 days. This record is registered in the Recorded Track area of the Voyage Recording box using the UTC data of the record as reference name.

These registrations will lose their Write-protect-mark “P” after 14 days.

The latest registration is displayed as the button line of the Recorded Tracks area.

Procedure: (Figure: 11–11)

Step 1 Select Voyage Recording from the Logs menu. The dialog box appears.

![Figure: 11–11 Recorder track]
**Position Receiver:**
This List box contains the integrated Position Receivers. Selection is performed either via the scroll bar or directly via the cursor. While plotting the trail type of position receiver is indicated at each interval mark.

**Time marker interval:**
This entry determines the Labeling intervals in minutes. While plotting the trail each section is marked with a time label.

**Display the Recorded Tracks:**
To display the recorded tracks select the desired track via cursor from the Recorded Tracks list.

**Command Buttons:**

- **Show**
  The recorded track is superimposed on the chart. As a recorded track may be some weeks old its location has to be looked up manually if you want to see it on the screen. Zoom out as far as necessary and look for the recorded track, then zoom in the selected trail.

- **Hide**
  The recorded track is removed from display.

- **Delete**
  Deletes recorded tracks.

Besides automatic registration of all ship’s navigation data, the ship’s position can additionally be marked using the Mark at Ship function (see chapter 7.1.4). This event will also be listed in the Recorded Tracks list and be marked with an asterisk if the Show user defined ship marker Mark at Ship check box is activated.
## 12 INTEGRATION MENU

### 12.1 INTEGRATION MENU COMMANDS

<table>
<thead>
<tr>
<th>Integration Commands</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1.1 Nav Device Selection...</td>
<td>Allows to select from available position sensors in the Integrated Navigation System (INS).</td>
</tr>
<tr>
<td>12.1.2 AIS Options...</td>
<td>Allows to select the specific Target information, displaying at the chart.</td>
</tr>
<tr>
<td>12.1.3 Integrating an ARPA Radar...</td>
<td>Turns on or off the tracking of acquired targets from an ARPA radar; turns on and off the display of target heading vectors. If you do not have a radar integrated, this menu command will be grayed (not available).</td>
</tr>
<tr>
<td>12.1.4 Radar Overlay Settings...</td>
<td>Option</td>
</tr>
<tr>
<td>12.1.5 Autopilot...</td>
<td>Option</td>
</tr>
<tr>
<td>Integration Commands</td>
<td>Function</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| 12.1.6 Echosounder... | **Option**
Used to enter an depth alarm for an integrated echosounder. If you do not have an echosounder integrated, this menu command will be grayed (not available). |
| 12.1.7 Wind Sensor... | **Option**
Allows the user to specify whether you want to have wind information displayed relative to own ship or as true wind speed and direction. |
| 12.1.8 NavTex... | **Option**
Allows the user to display the NavTex information. |
| 12.1.9 Ship Info... | Specifies the ship’s dimensions; specifies location of navigation device antennas relative to bow and port side. |
| 12.1.10.1 Tender Configuration.. | **Option**
Allows the user to set general Tender options, to maintain the list of configured tenders and to manage recorded tender trails. |
| 12.1.10.2 Tender Information | **Option**
Allows the user to call up the alphanumerical Tender information. |
| 12.1.11 Monitor Settings | Allows the user to set the Backlight Brightness and the Menu Infopanel Brightness. |
| 12.1.12 Release USB Storage | Allows you to save datas on a removal USB device. |
12.1.1 Navigation Devices Selection

Use the Nav Device Selection command to select from the type(s) of navigation positioning device(s), speed device(s) and depth device(s) you have integrated into the ECDIS or Multifunction Console used as single system (Console, Black Box Version) or used in the Integrated Navigation System (INS).

**Procedure:** (Figure: 12-2)

Sensor selection:
- Step 1  Select the ship menu (Figure: 7-1).
- Step 2  Select Nav Device Selection...

![Figure: 12-2 CCRS Selection Mode]
(1) **CCRS SELECTION MODE.**

Within this selection possibility, the type of sensor selection is selected.

**AUTO** for the automatic sensor selection. The designation of the sensor soft buttons is displayed in GRAY. GRAY means cannot be selected because active. The status display shows the selected mode **AUTO**.

**MAN** for manual sensor selection. The designation of the sensor soft buttons is displayed in BLACK. BLACK means selectable. The status display shows the selected mode **MAN**.

(2) **POSITION**

All sensors which can be used within a single system or INS are displayed at the position display.

The SELECT soft buttons are available only in **MAN** mode. **ENABLE** selection is available in **AUTO** mode and **MAN** mode. **ENABLE** means that the sensor information has been included in the CCRS rating.

**DISABLE** means that the sensor information has been included in the CCRS rating. However this sensor information is not forwarded as active information to the down line applications Radar and ECDIS. The quality indicator (GREEN, ORANGE and RED) is always displayed within the STATUS display. The additional entry of the device designation depends on the content of the data telegram received.

In case of failure of the position sensors the **MANUAL** select function is enabled.

In case of the failure of all position sensors, the last valid position is transferred to the **MANUAL** field and declared as the valid position.

The valid position information must be from the last hour. In this case the system calculation considered the actual heading and speed and this position information. Older position information will be not accepted from the
system.

Within this field, position corrections can be made via an on-screen keyboard. The entered position serves as the anchor position for the dead reckoning.

**Action**
Position the trackball-guided cursor on e.g. 1st field and press the left trackball button. The online keyboard appears, the system is operated via the trackball-guided cursor. The input must be terminated with the ENTER key. The online keyboard disappears.

(3) **HEADING**
All sensors which can be used within in a single system or INS are displayed at the heading display.

The SELECT soft buttons are available only in MAN mode.

ENABLE selection is available in AUTO mode and MAN mode.

ENABLE means that the sensor information has been included in the CCRS rating.

DISABLE means that the sensor information has been included in the CCRS rating. However this sensor information is not forwarded as active information to the down line applications Radar and ECDIS.

The quality indicator (GREEN, ORANGE and RED) is always displayed within the STATUS display. The additional entry of the device designation depends on the content of the data telegram received.

(4) **SPEED THROUGH WATER**
All sensors which can be used within in a single system or INS are displayed within the SPEED THROUGH WATER display.

The SELECT soft buttons are available only in MAN mode.
ENABLE selection is available in AUTO mode and MAN mode.

ENABLE means that the sensor information has been included in the CCRS rating.

DISABLE means that the sensor information has been included in the CCRS rating. However this sensor information is not forwarded as active information to the down line applications Radar and ECDIS.

The quality indicator (GREEN, ORANGE and RED) is always displayed within the STATUS display. The additional entry of the device designation depends on the content of the data telegram received.

Failure of the speed sensors.

In case of the MANUAL select function is enabled. After the failure of all speed sensors, the last valid speed through water (STW) information is transferred to the MANUAL field and declared as the valid STW. Within this field, speed corrections can be made via an on-screen keyboard.

**Action**

Position the trackball-guided cursor in the field and press the left trackball button. The online keyboard appears, the system is operated via the trackball-guided cursor. The input must be terminated with the ENTER key. The online keyboard then disappears.

(5) **SPEED OVER GROUND**

All sensors which can be used within in a single system or INS are displayed within the SPEED OVER GROUND display.

The SELECT soft buttons are available only in MAN mode.

ENABLE selection is available in AUTO mode and MAN mode.

ENABLE means that the sensor information has been included in the
CCRS rating.

DISABLE means that the sensor information has been included in the CCRS rating. However this sensor information is not, however, forwarded as active information to the down line applications Radar and ECDIS.

The quality indicator (GREEN, ORANGE and RED) is always displayed within the STATUS display. The additional entry of the device designation depends on the content of the data telegram received.

(6) DEPTH
All sensors which can be used within in a single system or INS are displayed at the DEPTH display.

The SELECT soft buttons are available only in MAN mode.

The ENABLE selection is available in AUTO mode and MAN mode.

ENABLE means that the sensor information has been included in the CCRS rating.

DISABLE means that the sensor information has been included in the CCRS rating. However this sensor information is not forwarded as active information to the down line applications Radar and ECDIS. The quality indicator (GREEN, ORANGE and RED) is always displayed within the STATUS display. The additional entry of the device designation depends on the content of the data telegram received.
Sensor Performance;
The sensor performance is categorized in three rating levels:

- **GPS1** as result from CCRS rating this sensor has good integrity (GREEN).

- **GPS2** as result from CCRS rating this sensor has doubtful integrity. (ORANGE) Data provided by this sensor can be used carefully, but not for automatic control functions.
  
  Please note:
  
  If there is only one source for a certain type of data, this source has doubtful integrity. In this case, doubtful integrity is not an indication for bad performance.

- **GPS2** as result from CCRS rating this sensor is either defect or data is not available (RED).

Figure: 12-3 Sensor Status
12.1.2 AIS / ARPA Options

The *Automatic Identification System* (AIS) is designed for automatic and autonomous data communication between ships. The communication data consists of information such as identification, position, speed, course over ground (detailed information see AIS Manual).

The ECDIS is able to exchange text messages with other ships via AIS.

The Automatic Radar Plotting Aid (ARPA) is designed for automatic tracking of radar targets. The ARPA targets are visualized in alphanumeric format alongside with AIS targets (for symbolic visualization of ARPA targets see chapter 12.1.3).

12.1.2.1 Calling up AIS / ARPA Options

If there is an AIS connected to the ECDIS, AIS targets can be displayed on the ECDIS screen, detailed information on AIS Targets can be shown on request and Alarms for LOST and DANGEROUS AIS Targets will be generated.

The *AIS Options*... function allows to change the following settings (Figure: 12-4):

*Options*
- The Display of AIS Targets can be enabled or disabled.
- Progressive ships movement.
- Ship trails (available in progressive mode only).
- Show Labels on active Targets.
- Draw the Hull shape. If the AIS target symbol displays only, select the Zoom In function until the symbol changed to the Hull shape.
- Show AIS Aids to Navigation (AtoN) and Base Stations
- All Targets (except for dangerous targets) can be displayed as Sleeping Targets.
- The Range at which the AIS Targets shall be displayed can be set from 10 to 55 NM (no limits for ARPA targets).
- A range can be defined, above which no LOST Target Alarms will be generated (no limits for ARPA targets).
All Targets which got lost outside this range will disappear immediately without an indication.

**Status**
- The status of the connection to the AIS Server is displayed (OK / Not Available).
- The vector length for the AIS targets is displayed. The vector length is the same as the own ship’s and ARPA target vector length.

**Limits for Dangerous Targets**
- The limits for CPA () and TCPA () to generate Dangerous Target Alarms can be adjusted (ARPA targets may become dangerous too, but will not trigger an alarm) on ECDIS.
- It can be defined whether the CPA limit, the TCPA limit or both values will cause Dangerous Target Alarm.

![AIS Options menu](image)

Figure: 12-4  AIS Options menu

If the Own Ship AIS Transponder Data is available at the ECDIS, an extended AIS Options Dialog is displayed.
The extended AIS Options dialog provides means to change the Own Ship Voyage Settings and write them to the AIS Transponder. The none voyage related Own Ship AIS Transponder data may be displayed.
Procedure: (Figure: 12-7)

Step 1  Select Target Options.. from the Integration menu or alternative via Tool Bar Key.
       The Dialog box appears.
       Select and change the Options... and Limits for Dangerous Targets.

Step 2  Click on the OK button. The target presentation changes, the dialog box is closed.
        Or click on the Cancel button, all changes are discarded.
        The dialog box is closed.

Step 3  Click on the Target Information button, the Target Information window appears.
        This dialog can also be accessed by cursor, [Middle] clicking trackball button on an AIS or ARPA Target.
        For changing the selected Target, place the cursor at a User ID and click on the [Left] button. Or place the cursor on an Target in the chart and click on the middle button.
Figure: 12-7 Selecting an AIS Target
12.1.2.2 AIS Messages

The ECDIS is able to exchange text messages with other ships via AIS.

Procedure: (Figure: 12-8)

Step 1 Select AIS Options.. from the Integration menu.
   The Dialog box appears.
Step 2 Click on the Messages button.
   The AIS Messages box appears and shows a list of previously sent and
   received AIS messages.
Step 3 There are options to filter the AIS messages;
   Direction can be ANY or SEND or RECEIVED
   Type can be ANY or SAFETY or BINARY
   Addressed can be ANY or BROADCAST or ADDRESSED

Step 4 Click on the New Message button

   NOTE
   The reception of a new AIS message will be indicated by a warning in
   the ECDIS Alarm window.

   The New Message box appears.
   The message may be send as Binary Text Message or as a Safety
   Related Message to either a dedicated AIS Target or as Broadcast
   Message.
   The arrow button on the right provides some standard distress
   messages which messages which may be inserted into the message
   text.
   Edit your text file and press the Send button.

Step 5 Click on the Clear List button.
   All AIS entries (depending from the Filter attributes) will be deleted.
Step 6 Click on the Delete Sel button.
   The selected AIS message will be deleted.
Step 7 Click on the Export button.
   The selected AIS message will be stored on a removal USB device.
Figure: 12-8 AIS Messages
12.1.2.3 AIS Symbols

Figure: 12-9 shows a possible ECDIS display with AIS Targets and AIS Information window.

![ECDIS display with AIS Targets](image)

The AIS symbols are assigned 5 different pieces of target information. Depending on the situation, each symbol has a different meaning (see AIS symbols). The Target information dialog box can be displayed as an additional source of target information. All entered targets are listed in the upper window. The information on a target selected from the list or via cursor is displayed in the lower window (see Target Information window).
AIS symbols:

<table>
<thead>
<tr>
<th>AIS Target</th>
<th>Symbol</th>
<th>Description of symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS targets (sleeping)</td>
<td></td>
<td>An isosceles, acute-angled triangle is used with its centroid representing the target’s reference position. The most acute apex of the triangle is aligned with the heading of the target, or with its COG, if heading information is not available. The symbol of the sleeping target is smaller than that of the activated target.</td>
</tr>
<tr>
<td>Activated AIS target</td>
<td></td>
<td>An isosceles, acute-angled triangle is used with its centroid representing the target’s reference position. The most acute apex of the triangle is aligned with the heading of the target, or with its COG, if heading information is not available. The COG/SOG vector is displayed as dashed line starting at the centroid of the triangle. The heading is displayed as solid line of fixed length starting at the apex of the triangle A flag on the heading indicates a turn and its direction.</td>
</tr>
<tr>
<td>Selected target</td>
<td></td>
<td>A square indicated by its corners is drawn around the target symbol.</td>
</tr>
<tr>
<td>Dangerous target</td>
<td></td>
<td>A bold line clearly distinguishable from the standard lines is used to draw the symbol. The target is displayed with: vector, heading and rate of turn indication. The symbol flashes until the Dangerous Target Alarm is acknowledged. Dangerous Targets are displayed in red.</td>
</tr>
<tr>
<td>Lost target</td>
<td></td>
<td>Lost target symbols presented as crossed lines centered on the target symbol. The line flashes until the Lost Target Alarm is acknowledged. The target is displayed without vector, heading and rate of turn indication.</td>
</tr>
</tbody>
</table>
The Target Information dialog window

In the upper part of the dialog a list of all AIS and ARPA targets is displayed. This is subdivided into columns for the User ID (AIS MMSI), Call Sign, Ship’s Name, CPA in NM, TCPA in minutes, Distance from own ship in NM, Bearing from Own Ship in degree, Target Speed in knots and Target Course over ground in degree.

By clicking on one of the column headers the targets are arranged according to the selected feature.

Dependant on the number of targets the list may be scrollable. The dialog can be resized in order to expand the list of displayed targets.

The ratio between the 2 list can be changed by doing the separator with the trackball.

Figure: 12-10 AIS information dialog box
The image in the first column indicates the AIS Target Status (Table 12-1).

<table>
<thead>
<tr>
<th>Image</th>
<th>Status of the AIS Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>🔄</td>
<td>Tracked</td>
</tr>
<tr>
<td>⚠️</td>
<td>Dangerous</td>
</tr>
<tr>
<td>✗</td>
<td>Lost</td>
</tr>
<tr>
<td>🚂</td>
<td>Dangerous &amp; Lost</td>
</tr>
</tbody>
</table>

Table 12-1  AIS Target Status

The list in the lower part shows detailed information about the selected targets from the upper list.

For changing the selected target, place the cursor at a User ID and click on the [Left] button. Or place the cursor at an AIS or ARPA target in the chart and click on the [Middle] button.

The list of Target Information can be scrolled to display more parameters of the selected Target (Figure: 12-11).

<table>
<thead>
<tr>
<th>Target Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
</tr>
<tr>
<td>ID</td>
</tr>
<tr>
<td>Call Sign</td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Ship &amp; Cargo type</td>
</tr>
<tr>
<td>CPA / TCPA</td>
</tr>
<tr>
<td>Distance / Bearing</td>
</tr>
<tr>
<td>Nav Status</td>
</tr>
<tr>
<td>Position / last update</td>
</tr>
<tr>
<td>Position Device</td>
</tr>
<tr>
<td>Heading</td>
</tr>
<tr>
<td>COG</td>
</tr>
<tr>
<td>SOG</td>
</tr>
<tr>
<td>ROT</td>
</tr>
<tr>
<td>Destination</td>
</tr>
<tr>
<td>ETA</td>
</tr>
<tr>
<td>Length / Width</td>
</tr>
<tr>
<td>Drought</td>
</tr>
<tr>
<td>IMO Number</td>
</tr>
</tbody>
</table>

Figure: 12-11  Example for a AIS Target Information
If the selected Target is Dangerous, this is also indicated in the CPA/TCPA row (DANGEROUS TARGET).
If the selected Target is Lost, this is also indicated in the Position row (LOST TARGET).
All target information which is (currently) not available is indicated as <unknown>.
The contents of both lists is updated in regular intervals.
The button AIS Options will open the AIS Options dialog (chapter 12.1.2.1).

Targets which are currently not visible due to a disabled receive channel are marked with an ‘*’ in front of their ID value. For such situations a popup context menu may be used to re-enable the respective channel (see Figure: 12–13).
12.1.3 Integrating an ARPA Radar

NOTE
When integrating a radar which will accept data from ECDIS, it must not share a COM port with any other navigation device.

ECDIS’s ARPA radar interface allows you to integrate up to 6 radars as well as display and track up to 1000 acquired targets with optional target tracks, target trails and heading vectors per radar. The targets appear on the display as green colored symbols.

The target trails are like a high resolution ship’s track. They contain only a limited number of points. Once a trail is “full,” ECDIS begins dropping points off one end of the trail while adding them to the other. Target trails are displayed in real time only — that is, they cannot be saved and redisplay. To turn them off, simply select the Off button in the ARPA Radar Tracking dialog box.

ARPA target heading vectors are the same length as your own ship vector. ECDIS is capable of sending marker, lines and route information to selected radars. When sending information to be displayed on this radar, it must be the radar selected to be used in the ARPA Radar Tracking dialog box.

If ECDIS does not receive a signal from the target, the target is cleared from the display. Please see “Selecting the Navigation Devices”, chapter 12.1.1.
**Procedure:** (Figure: 12-14 and Figure: 12-15)

**Step 1** Select ARPA Radar Tracking from the Integration menu or alternative via Tool Bar Key.

The Dialog box appears.

Enable/Disable all the radar channels you wish to display.

The target labels are preceded by the Radar letter and the Radar cursors are labeled with the Radar letter.

To turn on perform the following:
- Radar Tracking Click on On in the Radar Tracking area.
- Target Trails Click on On in the Target Trails area.
- Heading Vector Click on On in the Target Heading Vector area.

**Step 2** Click on OK.

(Alternative selection via the Tool Bar Key)

![ARPA Radar Tracking dialog box]

**Figure: 12-14** ARPA Radar Tracking dialog box
**12.1.3.1 Turning OFF all Target Trails**

**Procedure:**

1. **Step 1** Select ARPA Radar Tracking.. from the Integration menu.
   - The Dialog box appears.
2. **Step 2** Click on the OFF option button under Target Trails.
   - This will remove all target trails from the display.

Figure: 12–15  Radar cursor (A,B) and Radar targets (A,B) on the ECDIS display
12.1.4 Radar Overlay Settings (OPTION)

The Radar Overlay Setting dialog box allows different optical settings for the Radar Overlay.
Is the Dialog box activated without radar signal, the elements Range, Sea Clutter, Rain Clutter, Gain and Correlation are deactivated first (chapter 12.1.4.1).

12.1.4.1 Radar Overlay

This function transmits the current radar image as overlay on the ECDIS and updates it periodically.
The transmission of the radar image (S-Band as well as X-Band) depends on the selected service setting. All settings selectable via the ECDIS depend on the radar signal and are confined to the ECDIS display.

The dialog between Radar and ECDIS is started via the soft button on the Toolbar or the Check Box in the Radar Overlay Setting dialog box.
After a short initialization phase, the Radar Overlay is displayed according to the chart scale on the current chart.

Procedure: (Figure: 12–16)

Step 1 Select from the Tool Bar. After the initialization the radar overlay appears on the ECDIS.
Or select the check box in the Radar Overlay Settings dialog box.

Step 2 Press Close to continue.
After the initialization the radar overlay appears on the ECDIS.

Figure: 12–16 Radar Overlay Settings – Enable Radar Overlay –
12.1.4.2 Using the Radar Overlay Settings

Procedure: (Figure: 12–17)

Step 1  Select Radar Overlay Settings from the Integration menu. The Radar Overlay Settings dialog box appears.

![Radar Overlay Settings dialog box](image_url)

Figure: 12–17  Radar Overlay Settings ..
Slider **Range**
The Range area on the ECDIS depends on the Pulse Width/Range selection on the RADAR (Figure: 12-18).

**Radar**

Pulse Width Selection
- SHORT
- MED1
- MED2
- LONG

**ECDIS**

Range Selection

<table>
<thead>
<tr>
<th>Range</th>
<th>0,12</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3,0</td>
<td>0,25</td>
</tr>
<tr>
<td></td>
<td>6,0</td>
<td>0,5</td>
</tr>
<tr>
<td></td>
<td>0,75</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>24,0</td>
<td>3,0</td>
</tr>
<tr>
<td></td>
<td>48,0</td>
<td>6,0</td>
</tr>
</tbody>
</table>

**Figure: 12-18** Pulse Width / Range Selection

If the Pulse Width/Range is changed on the RADAR, the range of the Radar Overlay is automatically adjusted to the new range (Figure: 12-19).

**ECDIS**

Range Selection

<table>
<thead>
<tr>
<th>Range</th>
<th>0,12</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3,0</td>
<td>0,25</td>
</tr>
<tr>
<td></td>
<td>6,0</td>
<td>0,5</td>
</tr>
<tr>
<td></td>
<td>0,75</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>24,0</td>
<td>3,0</td>
</tr>
<tr>
<td></td>
<td>48,0</td>
<td>6,0</td>
</tr>
</tbody>
</table>

**Figure: 12-19** Switch over to another Pulse Width

After the initialization the radar overlay appears on the ECDIS.
Step 2  Use the check box Auto adjust the Range to the view scale to centre the Radar Overlay in ECDIS.

Slider **Sea Clutter**
Keep adjusting Slider, as possible, until Sea Clutter is no longer disturbing the Radar Overlay.
During this adjustment, the radar targets must be clearly visible at any time.

Slider **Rain Clutter**
Keep adjusting Slider, as possible, until Rain Clutter is no longer disturbing the Radar Overlay.
During this adjustment, the radar targets must be clearly visible at any time.

Slider **Gain**
The Gain slider adjusts the sensitivity of the radar display. If properly adjusted, the Gain control results in noise appearing as a light speckle at the dim level.

This light speckle setting yields the maximum detectability of targets against a noise background. If the Gain is set too low, weak or distance targets could be missed.

**Correlation**

**Scan To Scan**
This process requires 3 complete antenna rotations or scans of the antenna to build up or decay detected targets.
To the operator, this means that when a target is first detected, it is painted dim.
If on the next scan it is still present at the same location, it is painted at mid level and on the third scan, it is painted bright. As long as the target is present, it will paint bright. If the target fades in and out, then it will remain on the screen, dropping from bright to mid and back to bright. If the target is lost altogether, then it will take three scans before it completely disappears.
Figure: 12-20 Correlation Scan To Scan

Press the button Apply button, after the initialization the radar overlay appears on the ECDIS.

**Sweep To Sweep**

In the Sweep To Sweep Correlation mode, the targets, coast line etc. are displayed in a permanent GREEN shade.

Figure: 12-21 Correlation Sweep To Sweep

Press the button Apply button, after the initialization the radar overlay appears on the ECDIS.
12.1.5 Driving an Autopilot

**NOTE**

Track Control is not an ECDIS function. To activate this function an AUTOPILOT System has to be connected. For detailed information ask Raytheon Anschütz.

ECDIS allows the user to turn on or off the transmission of data to the autopilot as well as to specify a rate of turn, and the turning response. The turning response is the distance (number of ship lengths) you wish the autopilot to start turning the ship prior to reaching the wheel overpoint position. The “WOP” (wheel over point) marker will be moved to that location.

If you have an open route with an active waypoint, and you change the rate of turn, you will also change the predicted turning arc. Please see “Edit Route Command”, chapter 8.2.1.

When integrating an autopilot, it is necessary to connect it to an un-shared port. This is because autopilot data transmission is turned on and off using the Autopilot command. If the autopilot shares a port with another device, the data transmission of the device which shares the same port will also be stopped.

**NOTE**

The Talker ID, NMEA Output, and Checksum values should be entered when first integrating the autopilot. They do not need to be changed unless a new autopilot is integrated.
Procedure: (Figure: 12–22)

Step 1 Select Autopilot from the Integration menu. The Dialog box appears.

Step 2 Click inside the Turning response text box and enter the number of ship lengths you wish your autopilot to begin turning prior to reaching the wheel overpoint position.

Step 3 Click inside the Rate of Turn text box and enter a rate of turn.

Step 4 If you want ECDIS to automatically advance the autopilot to the next waypoint, click in the Auto advance to next Waypoint check box (when Raytheon Anschütz Autopilots used).

Step 5 Click on OK. A message box appears explaining that you need to set the rate of turn in your autopilot.
12.1.6 Integrating a Depth Sounder/ Setting the Depth Alarm

Use the Echosounder command to set an alarm depth. If you want to change the unit of measure for the depth display and alarm.

If the Conning Display Monitor (Option) is connected to the ECDIS the scaling of the depth display will be changed at the same time.

**WARNING**

**ALARM DEPTH MUST BE CALCULATED FROM THE TRANSDUCER HEAD, NOT FROM THE KEEL OR THE SURFACE.**

The Depth Alarm is only active if you have a depth sounder integrated with ECDIS. You may use depth alarm to alert you when the depth beneath the ship is equal to or shallower than a depth you specify. When the alarm is triggered, ECDIS displays a warning message and beeps every 5 seconds.

**Procedure:** (Figure: 12-23)

1. **Step 1** Select Echosounder from the Integration menu. The Dialog box appears.
2. **Step 2** Click in the Alarm Depth text box, then type the depth at which you want the depth alarm to go off or select Auto. Notice that the units for the alarm appear to the right of the box.
3. **Step 3** Click on OK. When the depth beneath your ship's transducer is equal to or shallower than the specified alarm depth, ECDIS displays a warning message and sounds an alarm.
4. **Step 4** To turn off the alarm, click on Acknowledge.
Figure: 12-23  Echosounder dialog box
12.1.7 Changing the Wind Display

ECDIS allows you to specify whether you want to display wind data, in the information panel, relative to your own ship, or as true wind. Depending on the option selected in the dialog box, the information panel will display one of three types of wind. If you select True Wind, ECDIS will determine which type of true wind to display depending on the information it is receiving.

True (G) - Wind Speed and Direction over Ground (wind effect if you are not moving); If ECDIS is receiving wind speed and course over ground, the information panel will display True (G) wind direction.

True (W) - Wind Speed and Direction over Water (takes into consideration the effects of the wind and water currents on the vessel); If ECDIS is not receiving speed and course over ground, it will look for speed and course over water and will display True (W) direction.

Relative - Wind Speed and Direction over Gyro (takes into consideration wind and water currents on the vessel as well as the ship’s speed and heading); Lastly, if ECDIS is not receiving speed and course over ground or water, it will display relative wind direction.

**Procedure:** (Figure: 12-24)

1. **Step 1** Select Wind from the Integration menu. The Dialog box appears.
2. **Step 2** Click on the appropriate option button for the type of wind you want to display.
3. **Step 3** Click on OK.
12.1.8 Navigational Text Messages NavTex

The NavTex messages are automatically stored and can be displayed in the NavTex window.

![NavTex Dialog](image)
12.1.8.1 **NavTex messages**

Each line consists of the following information (see Figure: 12-26):
- An icon representing the type of message
- Timestamp of the (last) receipt of the NavTex message
- Message type
- NavTex message code
- UTC time from NavTex NMEA message (if provided)
- Frequency the message was received on
- Error rate in %
- Protection indicator

Each of the messages may be expanded to show the contents of the message (or collapsed) by double clicking on the message line (Step 1). The list can be scrolled either with the cursor keys or with the mouse by using the scrollbars (Step 2).

![Figure: 12-26 NavTex messages with expanded information](image-url)
12.1.8.2 NavTex messages with position coordinate information

A position coordinate information may be extracted automatically from the contents of a NavTex message. If valid latitude / longitude coordinates are recognized in a line of a NavTex message, the ECDIS will automatically move the chart to this position after double clicking on the message line.

Geographic coordinates extracted from the selected NavTex message will be displayed on the chart.

Figure: 12-27 NavTex messages with position coordinate information
12.1.8.3 NavTex functions

On the right hand side is a set of buttons for the following functions (see Figure: 12-25):

- **Collapse All**: To restore the list view with all messages collapsed.
- **Expand All**: To show the message contents of all messages
- **Print**: To print the selected message.
- **Export**: To export the select (or all) message as a text file to the selected drive.
- **Delete**: To delete the selected message.
- **Protect**: To protect (or unprotect) the selected message from automatic deletion after 72 hours.
- **Refresh**: To refresh the list of NavTex message (will be enabled after new messages have been received) *
- **Close**: To close the window.

*) Newly received NavTex messages will also be indicated by a marker on the NavTex toolbar button.

Figure: 12-28 NavTex toolbar button with marker

If a new NavTex SAR message is received, a corresponding warning “NAVTEX: SAR MSG RECEIVED” is issued on the ECDIS.

If a NavTex message is repeated, it is stored only once with the timestamp of the latest reception.

Old NavTex messages are automatically deleted after 72 hours, except when marked as protected. Up to 50 messages may be protected from automatic deletion.
12.1.8.4 Enable Filter

If the Enable Filter checkbox is marked, the list of Navtex message may be filtered by the following criteria:

- **Frequency:** The frequency on which the message has been received (Not over air, 490 kHz, 518 kHz or 4209.5 kHz)
- **Last:** The age of the message (between 1 hour and 72 hours)
- **Messages content:** The contents of the message text
- **Message type:** The message type

Each time the filter criteria have been changed, the changes have to be applied by the corresponding button. If the list of Navtex message is filtered, this is indicated in the titlebar of the Naxtex window.

![Figure: 12-29 Navtex messages with the Enable Filter function](image-url)
12.1.9 **Entering Information about Your Vessel (Ship Info Command)**

The Ship Info command is where you enter the dimensions of the vessel, as well as specify where the navigational antennas are located. ECDIS uses the entered information in many ways. First, it draws the ship symbol so that it is proportional to the specified vessel size. More importantly, because ECDIS knows where on the ship the antennas are located, it can offset the ship symbol from that point, giving you the accurate representation of your position relative to other objects.

**NOTE**

Only Safety Contour and Safety Depth can be changed. All other entries can only be modified in service mode.

**Procedure:** *(Figure: 12-30)*

1. Select Ship Info from the Integration menu. The Dialog box appears.
2. Enter the desired Safety Contour and the Safety Depth.
3. Click on the OK button.

![Ship Info dialog box](Figure: 12-30)
12.1.10 Tender Tracking (OPTION)

Tender Tracking implies a Seetrac Tender Tracking System. The ECDIS on the main ship allows the Tender observation and recording. The Tenders are displayed as small violet circles with a course vector.

Furthermore Tender information can be displayed via the Tender Information window (Figure: 12–31).
12.1.10.1 Tender Configuration

Note: Dependant on the Type of the Tender Tracking system there are minor differences:

- Some Tender Systems do not provide SOG and COG data for the Tenders. In this case the Tender Symbols are displayed without a vector and SOG / COG is not displayed in Tender Info.
- The Tender ID may be called TTC or TID
- Some Tender Systems do not require a Channel Number to be configured.
- Some Tender Systems do not have a distinction between Managed Mode and Autonomous Mode and do not need a TOC to be configured.

The Tender Configuration is subdivided into three configuration parts;

**Options** used to set general Tender Options
**Configuration Tender** used to maintain the configured Tenders
**Manage Recordings** used to manage recorded Tender trails

**Procedure:** Options (Figure: 12-32)

Step 1 Select Tender Configuration.. from the Integration menu or alternative via Tool Bar Key..
The Dialog box appears.
Step 2 Enable the desired Tender Options such as
- Enable Display of Tenders and recorded trails
  Show/Hide Tender symbols and recorded trails.
- Enable Lost Tender Alarm
  Enable/Disable a TENDER LOST alarm if a Tender is no longer reporting the position.
- Enable Tender Range Alarm
  Enable/Disable a TENDER OUT OF RANGE alarm if the distance to a Tender exceeds the set Range Limit.
- Manage Mode or Autonomous Mode
  These Mode selection has to be done in dependency with the Seetrac Basic Unit (done in the Service Mode).
The Time On Channel is used if there are Tenders configured on different channels (see Service Mode).

Managed mode means;
The Time On Channel has to be preselected in the Service Mode.

Autonomous mode means;
In this case the Time on Channel function is not used.
The tender channel selection is managed by Seetrac Basic Unit.

Step 3  Click on the Apply or OK button for closing the dialog.
Any changes to the Tender configuration or the Tender options become valid.

Figure: 12–32 Tender Configuration Options
Configure Tender is used to add new Tender, edit the values for TTC (Tender Transmission Code), Name, Channel and Recording status.

**Procedure:** Configuration (Figure: 12–33)

**Step 1**  Select Tender Configuration.. from the Integration menu or as an alternativly via the Tool Bar Key.

The Dialog box appears.

**Step 2**  Add a new Tender

TTC

TTC is the Tender ID which is set in the corresponding Tender unit.

A tender may be temporarily enabled or disabled by checking/unchecking the checkbox.

Name

Each Tender may be assigned a name for display purposes.

Ch

The channel needs to be set to the corresponding coded channel which is set in the corresponding Seetrac Tender unit.

Rec

Select when the tender shall be recorded using the Tender Recording function.

Before changing the record status, Tender Recording has to be disabled.

**Step 3**  A selected Tender may be Deleted, moved Up or Down in the List.

**Step 4**  Click on the Apply or OK button for closing the dialog.

Any changes to the Tender configuration or the Tender options become valid.
(alternative selection via the Tool Bar Key)

**Step 1**

**Step 2**

**Step 3**

**Step 4**

Disable Tender Recording.
Enable or disable the record status

Figure: 12-33 Tender Configuration
Manage Recordings allows the selection of individual Tender trails. The trails are displayed in a orange or red line. A dotted orange line indicates a depth lower than the Highlighted Depth value. A solid red line indicates a shallow water contour.

Trails can be labeled (Label Interval) with time and depth marker. Individual by recorded tender trail may be displayed or hidden using the corresponding check checkbox.

One or more recorded trails may be selected simultaneously for deleting or exporting.

The Export function will generate tab separated text files.

**Procedure**: Manage Recording (Figure: 12–34)

- **Step 1** Select Tender Configuration.. from the Integration menu or as an alternatively via the Tool Bar Key.
  
  The Dialog box appears.
  
  Select Manage Recording.

- **Step 2** Select individual by recorded tender trail.

- **Step 3** Delete allows to delete the selected recorded trail.

- **Step 4** Export allows to export the separated text files.

- **Step 5** Set the individual Label Interval and Highlighted Depth.

- **Step 6** Click on the Apply or OK button for closing the dialog.
  
  Any changes to the Manage Recordings become valid.

- **Step 7** Enable or disable the Tender Recording.
Figure: 12–34 Manage Recording
12.1.10.2 Tender Information

The active channel will be shown on the caption bar of the Tender Information Dialog.

Procedure: Tender Information (Figure: 12-35)

Step 1 Select Tender Configuration.. from the Integration menu or as an alternatively via the Tool Bar Key or by clicking on a Tender symbol in the sea chart.

The Dialog box appears.

Step 2 To Stop Recording.

Step 3 To Clear All Tender.

Step 4 Change to Tender Options.
12.1.11 Monitor Settings

This Backlight Brightness allows the operator to switch over between the function CENTRAL and LOCAL backlight dimming. The SYNAPSIS INS mostly consists of several MFCs they are combined in groups. In this case the selected CENTRAL function is used for one group.

The Menu and Infopanel Brightness allows the operator to find the optimum brightness for the Menu and Infopanel.

Procedure: (Figure: 12-36)

Step 1 Select Monitor Settings from the Integration menu. The dialog box appears.
Step 2 Select Central or Local for setting the Backlight Brightness per slider.
Step 3 Setting the Menu and Infopanel Brightness per slider.

Figure: 12-36 Monitor Settings
12.1.12 Release USB Storage Device (Option)

**NOTE**
This Function is only available on system with USB support.

With this function an USB Storage Device may be released for safe removal. If one or more USB Storage Device are connected to the system, a list of all devices is displayed and a selected device may be released.

**Procedure:** (Figure: 12-37)

1. Plug in the USB device.
3. Click on the Update button to refresh the List of USB devices.
4. Click on the Release button to release the selected USB device.

![Step 3](Image)

![Step 4](Image)

Figure: 12-37 Release USB Storage Device
13  HELP MENU

13.1  HELP MENU COMMANDS

The Help menu contains the following commands.

<table>
<thead>
<tr>
<th>Help Commands</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help Index...</td>
<td>Shows Help</td>
</tr>
<tr>
<td>System Information...</td>
<td>Shows detailed system information.</td>
</tr>
<tr>
<td>13.1.1 About...</td>
<td>Shows version and copyright information.</td>
</tr>
</tbody>
</table>

Procedure: (Figure: 13-2)

Step 1  Select About ECDIS. from the Help menu.
        The Dialog box appears.
Step 2  Click on OK to close the window.
Figure: 13-2 About ECDIS
14 Error Messages

The following is a list of alert messages which can be generated when working with ECDIS and Chart Station. The list provides the alert message text, the signification and the probable cause.

![Alarm Message](image)

Figure: 14-1 Error Message in the ECDIS

14.1 Warning and Notification Messages

Table 14-1 Alarms

<table>
<thead>
<tr>
<th>Alarm Message</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANCHOR WATCH ALARM</td>
<td>Ship moves out of user defined Anchor Circle</td>
</tr>
<tr>
<td>AIS DANGEROUS TARGET</td>
<td>One or more AIS Targets are below CPA/TCPA limits</td>
</tr>
<tr>
<td>AIS LOST TARGET</td>
<td>One or more AIS Targets are lost</td>
</tr>
<tr>
<td>APPROACH xxxxxxx</td>
<td>Searchlight is enabled and the ship is approaching the indicated danger</td>
</tr>
<tr>
<td>BACKUP NAVIGATOR ALARM</td>
<td>Track Control: Backup navigator error acc. To IEC 62065</td>
</tr>
<tr>
<td>CHANGING TRACK COURSE xxx</td>
<td>Track Control: AP is performing course change and WOP Alarm or Warning are to acknowledged</td>
</tr>
<tr>
<td>CONTROL MODE MISMATCH</td>
<td>AP is in Track Control while ECDIS is not in Track Control</td>
</tr>
<tr>
<td>DEMO VERSION</td>
<td>Not for Navigation</td>
</tr>
<tr>
<td>DEPTH TOO SHALLOW LESS THAN %1</td>
<td>Measured depth is below alarm limit</td>
</tr>
<tr>
<td>GUARD ZONE ALARM</td>
<td>ARPA Target is intruding the guard zone</td>
</tr>
</tbody>
</table>
### Alarm Message

<table>
<thead>
<tr>
<th>Alarm Message</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERRUPT TRACK CONTROL</td>
<td>Track Control has been interrupted by ECDIS</td>
</tr>
<tr>
<td>MAN OVERBOARD!</td>
<td>Man Over Board</td>
</tr>
<tr>
<td>TENDER ALERT</td>
<td>Tender (Option): Alert button pressed</td>
</tr>
<tr>
<td>TENDER LOST</td>
<td>Tender (Option): One or more Tenders lost</td>
</tr>
<tr>
<td>TENDER MOB MAN OVERBOARD</td>
<td>Tender (Option) MOB active</td>
</tr>
<tr>
<td>TENDER OUT OF RANGE</td>
<td>Tender (Option): One or more Tender out of range limit</td>
</tr>
<tr>
<td>TRACK END IN x MIN OR LESS</td>
<td>Track Control or Route Monitoring: The last waypoint of the track will be reached in x minutes or less.</td>
</tr>
<tr>
<td>TRACK END PASSED CHANGE STEERING MODE</td>
<td>Track Control or Route Monitoring: The last waypoint of the track has been passed</td>
</tr>
<tr>
<td>WAYPOINT MISMATCH</td>
<td>Track Control: Waypoint mismatch between ECDIS and AP</td>
</tr>
<tr>
<td>WOP IN x MIN OR LESS</td>
<td>Track Control or Route Monitoring: Wheel over point in x minutes or less</td>
</tr>
<tr>
<td>XTD GREATER THAN xx M</td>
<td>Track Control or Route Monitoring: Cross Track limit exceeded</td>
</tr>
</tbody>
</table>

### Table 14–2 Warnings

<table>
<thead>
<tr>
<th>Warning Message</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCS CHART HAS WARNINGS</td>
<td>The currently displayed ARCS chart has caused warnings. See ARCS Options – Chart Warnings for details</td>
</tr>
<tr>
<td>AUTOPILOT NOT READY</td>
<td>AP is not ready for Track Control operation</td>
</tr>
<tr>
<td>CHART xxxxxxx OUT OF DATE</td>
<td>The displayed ENC chart xxxxxxx is out of date. Update your charts via Charts – Update</td>
</tr>
<tr>
<td>CM93/3 CHART LICENSE WILL EXPIRE</td>
<td>A CM93/3 license will expire in less than a month</td>
</tr>
<tr>
<td>CONTROL MODE RESET REMOTELY</td>
<td>Track Control has been terminated from remote (AP operator unit)</td>
</tr>
<tr>
<td>ECDIS IS IN SETUP MODE</td>
<td>ECDIS is in service mode</td>
</tr>
<tr>
<td>NAVTEX: SAR MSG RECEIVED</td>
<td>New SAR message received via NavTex</td>
</tr>
<tr>
<td>NO OFFICIAL CHART USE PAPER CHART</td>
<td>No official ENC Chart available at the current position</td>
</tr>
<tr>
<td>NOT ENOUGH WAYPOINTS</td>
<td>Track Control: Initialisation error</td>
</tr>
<tr>
<td>AUTOPILOT</td>
<td>Track Control: NP203x or NP5500 Initialisation error</td>
</tr>
</tbody>
</table>
### Warning Message

<table>
<thead>
<tr>
<th>Warning Message</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>PASSED WAYPT: xxx</td>
<td>Track Control: Passed waypoint without passing the wheel over point</td>
</tr>
<tr>
<td>POSITION OFFSET IS APPLIED</td>
<td>A manual position offset is applied. See Ship - Position Offset</td>
</tr>
<tr>
<td>RADAR SIGNAL LOST</td>
<td>Radar Overlay (Option): No Radar signal</td>
</tr>
<tr>
<td>SHIP LEAVING ARCS CHART</td>
<td>Own ship will leave the displayed ARCS chart in less than 2 minutes</td>
</tr>
<tr>
<td>TRACK CANCELED NO ACTIVATION</td>
<td>Track Control (ASSA Autopilot only): No activation from ASSA</td>
</tr>
<tr>
<td>USE DEEPER SAFETY CONT xxx</td>
<td>The selected safety contour is not available from the currently displayed chart</td>
</tr>
<tr>
<td>WOP IN 30 SECONDS OR LESS</td>
<td>Track Control or Route Monitoring: Wheel over point in less than 30 seconds</td>
</tr>
</tbody>
</table>

### Information Message

<table>
<thead>
<tr>
<th>Information Message</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACKUP NAVIGATOR ALARM</td>
<td></td>
</tr>
<tr>
<td>NEW AIS MESSAGE RECEIVED</td>
<td>New text message received via AIS</td>
</tr>
<tr>
<td>NEW TRACK COURSE xxx</td>
<td>Track Control: AP is performing course change</td>
</tr>
<tr>
<td>NOT CONNECTION</td>
<td></td>
</tr>
<tr>
<td>PRI ROUTE MOTIFIED</td>
<td></td>
</tr>
<tr>
<td>PRI ROUTE xxx</td>
<td>The Primary Route is intersecting with the indicated dangers or cautions</td>
</tr>
<tr>
<td>REQ ROT GREATER THAN SHIP ROT</td>
<td></td>
</tr>
<tr>
<td>REQ ROT GREATER THAN AP ROT</td>
<td></td>
</tr>
<tr>
<td>SEC ROUTE xxx</td>
<td>The Secondary Route is intersecting with the indicated dangers or cautions</td>
</tr>
</tbody>
</table>
15 Back-up arrangement

15.1 Introduction

(Source of excerpts (BSH S33/N24) 1/01)
Following requirements must be met to allow the official paper chart on board of seagoing vessels under the German Flag to be completely replaced by an ECDIS system:

To ensure safe navigation in the area of intended operation, the ECDIS must be operated using official ECDIS data acc. to IHO Standard for Digital Hydrographic (Special Publication No. 57 Edition 3.0), abbreviated S57 and IHO S-63.

(Item 2)
In case official ECDIS data for the areas of intended operation cannot yet be made available by the responsible hydrographic services, official raster data in “RCDS-mode” can be used for navigation as a substitute. For these areas, however, a reduced set of official and up-to-date paper charts is to be carried on board the vessel. The selection of these charts is the duty of the captain and must comprise charts of following scales:

- for planning an intended voyage or passage:
  chart scale: 1 : 750 000 to 1 : 1 500 000

- for performing a planned voyage or passage on the open sea:
  chart scale: 1 : 100 000 to 1 : 500 000;

- for performing a planned voyage or passage in coastal waters with high traffic density or on approach of estuaries and harbours:
  chart scale: < 1 : 100 000.

(Item 4)
The ECDIS must be protected against possible failure using appropriate back-ups to ensure a safe completion of the voyage.
The current regulations allow following solutions:
a) a duplication of the ECDIS
b) carrying of a complete set of official and up-to-date paper charts

The carriage requirements under Item 2 for a reduced set of official and up-to-date charts when using the official raster data in RCDS mode remain unaffected by this. If the requirement for a back-up is met by the option Item 4.b, the reduced set of charts can, of course, be considered as part of the back-up.

15.1.1 Back-up ECDIS Version

The back-up version comprises two identical ECDIS units (Console or Table Top Version) and a DIGITIZER (see Annex – 8).

With the exception of the AUTOPILOT, both ECDIS units are separately supplied with the required sensor data (Gyro Compass, Log, GPS) via the Com 1...6 Interfaces.

The AUTOPILOT is usually connected to the ECDIS in the operational area. In case a discrepancy occurs within the tracking “ECDIS and AUTOPILOT”, switch over to another tracking mode.

Sea Charts
The ECDIS is rated for taking over and displaying different digitized charts. For non-officially approved chart formats an official redundant set of paper charts shall be provided (chapter 15.1).

Position Display
The redundant position display is ensured by a separate sensor feeding.

Route Planning
Route Planning with the ECDIS
Routes may only be planned and navigated using officially approved and digitized charts (S57) and in connection with an autopilot. The planning of routes can be effected via both ECDIS systems. The ECDIS transfers the routes automatically via the Ethernet.
Route Planning with the Digitizer
The Digitizer is hereby used for planning official routes. Planned routes are transferred to the ECDIS where they are managed by their designation.

15.1.2 Planning Station Version

The Planning Station Version consists of 1 ECDIS unit (Console or Table Top Version), a Personal Computer (PC) or Table Top Version and a DIGITIZER (see Annex – 8).

Sea Charts
The ECDIS is rated for taking over and displaying different digitized charts. For non-officially approved chart formats an official redundant set of paper charts shall be provided (chapter 15.1).

Position Display
The redundant position display is ensured by a separate sensor feeding.

Route Planning
Route Planning with the ECDIS.
Routes may only be planned and navigated using officially approved and digitized charts (S57) and in connection with an autopilot. The planning of routes can be effected via both ECDIS systems. The ECDIS transfers the routes automatically via the Ethernet.

Route Planning with the Digitizer
The Digitizer is used for planning official routes. Planned routes are transferred to the ECDIS where they are managed by their designation.
16 Weather Overlay (Option)

16.1 Introduction

The Weather Overlay (WO) transparently shows actual, historic or future weather information. Gridded binary data available in WMO - GRIB (FM 92-IX Ext.) coded files is read, decoded and shown with symbols and numeric values.

The following weather products are currently supported:
- Wind components (direction & force) and gust (10 meters above ground)
- Wind components (direction & force) (surface)
- Mean sea level pressure
- Air Temperature (2 meters above ground)
- Current components (direction & force)
- Significant height, combined wind waves + swell
- Mean direction of wind waves
- Mean period of wind waves
- Total cloud cover
- Wetterwelt combined weather symbol

**NOTE**

In the absence of ‘10 meter wind components’ the surface wind is shown when available.

The weather data is shown as a regular grid on top of all other ECDIS display layers. Depending on chart resolution, GRIB data resolution and actual viewing area, the weather grid locations are selected to show as most as possible weather information, thereby avoid hiding other important ECDIS information.
Figure: 16-1  Example showing Isobars, Wind symbols and numeric values for wind-speed and wind-direction

The user may customize the grid location spacing, select the products to show and how to layout a single grid location as a combination of weather product symbols and numeric values (see Options Dialog for details).
16.2 Toolbar

The weather toolbar contains shortcut items for the following actions:

- Global Weather Enable Switch
- Open Weather Installation Dialog
- Open Weather Options Dialog
- Open Weather Info Dialog
- Switch off Weather Grid symbols
- Set Single Grid layout
- Set Double Grid layout
- Set Full Grid layout
- Enable Air Pressure Isobars
- Enable Air Temperature Isotherms
- Enable Waves Height Isolines
- Show Symbols Legend

Figure: 16–2 Example toolbar showing globally enabled Weather overlay with selected FULL layout

The global Enable-Weather switch is the main control to enable or disable the weather data shown on the current ECDIS view. All weather dialog windows (Installation, Options, Info and Legend) may be operated in weather-switched-off state too.
16.3 Installation Dialog

The installation dialog shows a list of currently loaded GRIB data files. File operations are defined to modify the priority, switch the enable attribute, delete or purge files, select a file for inspection and auto follow the ECDIS view to display the geographic area of the current selected file.

Figure: 16–3 Example with 8 loaded GRIB files, average validity of 1 day and 10 hours, Med_W_Race_MS_01_42h.grb with future validity, and one file with expired validity, a currently selected and enabled GRIB file Med_E_Race_01_42h_29112011.grb, detailed information in the lower area for the selected file.

The upper area shows all currently loaded GRIB files in descending priority order.

Whenever weather data is available from multiple GRIB files (with identical type, validity and geographic location) the GRIB file with higher priority is selected to grab the weather data.
NOTE

When multiple GRIB files are enabled with overlapping geographic regions, the resulting grid region may not be synchronized to each other. This effect may be reduced by decreasing the view area.

The priority may be changed by moving files up (more priority) or down (less priority), (1.) selecting a continuous range and (2.) pressing the Up or Down button.

The Sort button will reorder all files according to the shown start time of all files – i.e. a newer start time has more priority then an older start time.

To delete files, (1.) select any collection of files and (2.) press the Delete button.

To purge files (expired or invalid), press the Purge button.

To enable or disable a file select the checkbox to the left of the file – a disabled file will temporarily not be used to access any GRIB data. Enable the Auto-Follow checkbox to force the ECDIS view to display the geographic region of a selected GRIB file – the area is shown bounded by an orange (bounded) rectangle.

In the lower area detailed information about a selected GRIB file is shown:

- Source: the emitting center and sub-center
- Geo Area: the geographic region of the data
- Grid Spacing: the grid spacing in units of degrees (0.400 horizontal and vertical in the example)
- Forecast Times: the overall forecast time range
- Products: contained products with abbreviated short names and description
To load additional GRIB files press the Load-Files button:

![Load Files](image)

Figure: 16-4   Example load-files list with 2 configured file loaders, namely LocalDrives and WetterWelt

Depending on the ECDIS configuration a list of file loaders is shown, or a single configured file loader is directly executed. When prompted by a list, click on the requested file loader to select and run that file loader.

On return from a file loader, the newly loaded files will be inserted into the current file list. When exceeding the GRIB maximum total file size (default: 100 MB) the loading of further files is aborted and that error condition must be confirmed by the user.

![LOAD GRIB FILES](image)

Figure: 16-5   Example showing an error condition after executed a file-loader (the loaded file size of the file 16092011_0000_America.grb would exceed the overall total limit of 100MB)

16.3.1   Local Drives

The LocalDrives file loader may load any GRIB files located on local drives.
Figure: 16–6  Example with selected USB folder J:/Weather_Download, showing 4 selected files with varying sizes

The Load button will copy and load the selected files with an optional overwrite warning message when trying to overwrite an already existing file.

The Load&Overwrite button will copy and load the selected files without warning messages.

In any case the dialog is closed and the control dialog will be reopened showing the newly loaded files – optionally with an intermediate file progress indication.

16.3.2  WetterWelt - Catalog

The Catalog WetterWelt file loader may load GRIB files remotely from a WetterWelt server.
Figure: 16–7  Example with a list of files within the Cargo group, 1 selected file Cargo_NorthSea_BalticSea_04_120h.zip

The Refresh button will reload the catalog. This may be useful when waiting for a delayed GRIB file production (see OnDemand mode below).

The Load button will copy and load the selected files with an optional overwrite warning message when trying to overwrite an already existing file.

The Load&Overwrite button will copy and load the selected files without warning messages.

In any case the dialog is closed and the control dialog will be reopened showing the newly loaded files – optionally with an intermediate file progress indication.

16.3.3 WetterWelt - OnDemand

The OnDemand WetterWelt file loader may load GRIB files remotely from a WetterWelt server depending on a user request form.
Figure: 16–8  Example with Package Selection named Weather Worldwide Highres, some selected products, geographic region, 3 days forecast, 6 hours stepping, 0.4 degrees resolution and an expected file size of 424 kb

On startup the currently viewed ECDIS region is taken as base input to Top/Left and Bottom/Right coordinate edit fields. Any valid geographic region may be selected not exceeding 180 degrees longitude range.

The Package Selection list contains available packages defined by WetterWelt and a user selectable entry which allows free changing of Forecast Days, Forecast Step and Grid Resolution parameters. Within a predefined package, no changes are allowed to Forecast Step and Forecast Resolution, while the Forecast Days may still be changed within a pre-defined range.

The user selectable ranges are:

- Forecast Days  1 to 10 days
- Forecast Step  1, 3, 6 and 12 hours
- Grid Resolution 0.100, 0.125, 0.400, 1.000 and 2.000 degrees

All listed products may be selected or de-deselected. But always inspect the returned GRIB file for any warning messages like "products not available".
The Load button will copy and load the selected files with an optional overwrite warning message when trying to overwrite an already existing file.

The Load&Overwrite button will copy and load the selected files without warning messages.

The WetterWelt server may respond with a special notice that the GRIB file will be produced but is not available immediately. In all these cases follow the on-screen instructions to retrieve the GRIB file. Normally the estimated date of completion is shown with an attached filename. The file is typically stored into the “On Demand” group within your catalog.

Figure: 16–9 Example delayed production notice with estimated date of completion Tue 17/01/2012 14:43 and filename 201201171441–005.grb

Whenever the server responds with this kind of notice the WetterWelt file loader is not closed, allowing the user to directly inspect his catalog by changing to the Catalog tab. Do not forget to refresh the catalog.

In all other cases the dialog is closed and the control dialog will be reopened showing the newly loaded files - optionally with an intermediate file progress indication.
16.4 Options Dialog

The options dialog shows the current configuration of attributes which directly control the visual appearance of weather overlay symbols and numeric values.

![Options Dialog Diagram]

Figure: 16–10 Example with selected full layout (wind, wind-num, waves, waves-num), all 3 selected iso-lines, selected show-units switch, wind-speed (kn, 70 kn limit), current-speed (kn, 3.0 kn limit), air-temperature (ºC, 60 ºC limit), waves-height (m, 10 m limit)

Four different layout setups are available:
- Off – no symbol and no numeric display
- Single display – a single symbol or numeric field
- Double display – two symbol and/or numeric fields side by side
- Full display – four symbol and/or numeric fields arranged in four-quadrant-layout
Single display example:

Figure: 16–11  wind symbol with numeric gust (28 kn)

Double display example:

Figure: 16–12  Left:  wind symbol with numeric gust (28 kn)  
Right:  numeric wave–height (2.5 m), wave–direction (288 °), wave–period (9 s).

Full display example:

Figure: 16–13  Top–Left:  wind symbol with numeric gust (28 kn)  
Top–Right:  wind–speed (22 kn), wind–direction (164 °), gust (28 kn)  
Bottom–Left:  wave symbol with numeric period (9 s)  
Bottom–Right:  numeric wave–height (2.5 m), wave–direction (288 °), wave–period (9 s).

For all layout configurations (Single, Double and Full) the symbol or numeric value may be selected from the full product range, not warning for redundant combinations:
The list of selectable symbols and numeric values:

- **Wind**    wind symbol (vane coded to speed, opt. numeric gust)
- **Wind Num** wind numeric values (speed, direction, gust)
- **Current**  current symbol (coded to speed)
- **Current Num** current numeric values (speed, direction)
- **Pres. Num** sea level pressure
- **Temp. Num** air temperature
- **Cloud**    cloud cover symbol (0-8 octants)
- **Cloud Num** cloud cover numeric percentage value (0-100 %)
- **Waves**    waves symbol (coded to height, opt. numeric period)
- **Waves Num** waves numeric values (height, direction, period)
- **WetterWelt** Wetterwelt combined weather symbol
- **Wind + Curr.** current symbol overlayed by wind symbol
- **Wind + Wave** wave symbol overlayed by wind symbol
- **Curr. + Wave** current symbol overlayed by wave symbol
## Symbols / Numeric Values

<table>
<thead>
<tr>
<th>Name (type)</th>
<th>Drawings</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wind</strong> (Symbol)</td>
<td>![Wind Symbol]</td>
<td>![Wind Symbol]</td>
</tr>
<tr>
<td><strong>Wind</strong> (Symbol)</td>
<td>![Wind Symbol]</td>
<td>- gust</td>
</tr>
<tr>
<td><strong>Wind</strong> (Numeric)</td>
<td>![Wind Numeric]</td>
<td>speed direction</td>
</tr>
<tr>
<td><strong>Wind</strong> (Numeric)</td>
<td>![Wind Numeric]</td>
<td>speed direction gust</td>
</tr>
<tr>
<td><strong>Current</strong> (Symbol)</td>
<td>![Current Symbol]</td>
<td></td>
</tr>
<tr>
<td><strong>Current</strong> (Numeric)</td>
<td>![Current Numeric]</td>
<td>speed direction</td>
</tr>
<tr>
<td><strong>Pressure</strong> (Numeric)</td>
<td>![Pressure Numeric]</td>
<td>sea level pressure</td>
</tr>
<tr>
<td><strong>Air Temperature</strong> (Numeric)</td>
<td>![Air Temperature Numeric]</td>
<td>Degrees Celsius</td>
</tr>
<tr>
<td><strong>Cloud</strong> (Symbol)</td>
<td>![Cloud Symbol]</td>
<td>octans</td>
</tr>
<tr>
<td><strong>Cloud</strong> (Numeric)</td>
<td>![Cloud Numeric]</td>
<td>cloud cover percentage</td>
</tr>
<tr>
<td><strong>Waves</strong> (Symbol)</td>
<td>![Waves Symbol]</td>
<td>period</td>
</tr>
<tr>
<td><strong>Waves</strong> (Symbol)</td>
<td>![Waves Symbol]</td>
<td></td>
</tr>
<tr>
<td><strong>Waves</strong> (Numeric)</td>
<td>![Waves Numeric]</td>
<td>height</td>
</tr>
<tr>
<td><strong>Waves</strong> (Numeric)</td>
<td>![Waves Numeric]</td>
<td>height direction</td>
</tr>
<tr>
<td><strong>Waves</strong> (Numeric)</td>
<td>![Waves Numeric]</td>
<td>height direction period</td>
</tr>
<tr>
<td><strong>WeatherWelt</strong> (Example Symbol)</td>
<td>![WeatherWelt Symbol]</td>
<td>cloudy weather</td>
</tr>
<tr>
<td>Alarm Colour Example</td>
<td>![Alarm Colour Example]</td>
<td>wind symbol with gust</td>
</tr>
</tbody>
</table>

(see below for detailed table)
Additionally the Options Dialog controls the following display options:

- **Air Pressure (Iso)** shows consecutive iso-lines for mean-sea-level-pressure - in steps of 5 hPa
- **Air Temperature (Iso)** shows consecutive iso-lines for air-temperature-2-meter – in steps of 5 ºC, independent of the currently selected air temperature unit
- **Waves Height (Iso)** shows consecutive iso-lines for waves height – in steps of 1 m
- **Show Units** shows unit indication near to all numeric values and isolines - isobars will never show a unit indication (i.e. fixed to hPa)
- **Large Symbols** shows larger grid symbols and numeric grid values
- **More Grids** shows more grid locations – i.e. reduces the visual grid space area between each other (for single layout only)

For Wind Speed, Current Speed, Air Temperature & Waves Height the units and alarm limits may be selected:

- **Wind Speed** kn, km/h, m/s
- **Current Speed** kn, km/h, m/s
- **Air Temperature** ºC, ºF
- **Waves Height** m, ft

Values (symbols, iso-lines and numeric values) exceeding the configured limit will be shown in orange colour.
### WetterWelt Symbol

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="sky clear" /></td>
<td>sky clear</td>
<td><img src="image" alt="cloudy 30%" /></td>
<td>cloudy 30%</td>
</tr>
<tr>
<td><img src="image" alt="cloudy 50%" /></td>
<td>cloudy 50%</td>
<td><img src="image" alt="cloudy 100%" /></td>
<td>cloudy 100%</td>
</tr>
<tr>
<td><img src="image" alt="haze" /></td>
<td>haze</td>
<td><img src="image" alt="fog" /></td>
<td>fog</td>
</tr>
<tr>
<td><img src="image" alt="rain with some clouds" /></td>
<td>rain with some clouds</td>
<td><img src="image" alt="rain with clouds" /></td>
<td>rain with clouds</td>
</tr>
<tr>
<td><img src="image" alt="rain with blue sky" /></td>
<td>rain with blue sky</td>
<td><img src="image" alt="snow with blue sky" /></td>
<td>snow with blue sky</td>
</tr>
<tr>
<td><img src="image" alt="snow with some clouds" /></td>
<td>snow with some clouds</td>
<td><img src="image" alt="havy rain with clouds" /></td>
<td>havy rain with clouds</td>
</tr>
<tr>
<td><img src="image" alt="snow with rain" /></td>
<td>snow with rain</td>
<td><img src="image" alt="snow with clouds" /></td>
<td>snow with clouds</td>
</tr>
<tr>
<td><img src="image" alt="storm with rain" /></td>
<td>storm with rain</td>
<td><img src="image" alt="snow with rain and clouds" /></td>
<td>snow with rain and clouds</td>
</tr>
<tr>
<td><img src="image" alt="heavy storm with hail" /></td>
<td>heavy storm with hail</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


16.4.1 Info Dialog

The info dialog shows all available values depending on the current mouse-over location.

![Weather Info]

<table>
<thead>
<tr>
<th>Pos</th>
<th>N43°27.886' W003°08.465°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>270.7°</td>
</tr>
<tr>
<td>Gust</td>
<td>15.7 kt</td>
</tr>
<tr>
<td>Current</td>
<td>21.6 kt</td>
</tr>
<tr>
<td>Pressure (MSL)</td>
<td>1025.0 hpa</td>
</tr>
<tr>
<td>Temperature (2 m)</td>
<td></td>
</tr>
<tr>
<td>Cloud Cover</td>
<td></td>
</tr>
<tr>
<td>Waves</td>
<td>3.5 m</td>
</tr>
<tr>
<td></td>
<td>320.0°</td>
</tr>
<tr>
<td></td>
<td>8°</td>
</tr>
</tbody>
</table>

![Forecast Info]

<table>
<thead>
<tr>
<th>Inst</th>
<th>Med_W_Race_01_42h_05122011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live</td>
<td>2011-12-06 15:00</td>
</tr>
</tbody>
</table>

Figure: 16–15 Example with shown values for wind (direction, speed, gust), air pressure, waves height direction and period, current used GRIB file name Med_W_Race_01_42h_05122011, current forecast time 2011–12–06 15:00 and mouse-over geographic location

The Info Dialog shows a number of current (mouse-over) items:

- **Pos** mouse-over geographic location
- **Wind** direction, speed
- **Gust** speed
- **Current** direction, speed
- **Air Pressure** mean sea level pressure
- **Air Temperature** air temperature (2-meter)
- **Cloud Cover** total cloud cover, 8 octants
- **Waves** height, direction, period
- **File Name** currently used GRIB file name
- **Date / Time** currently used forecast date/time
Pressing the Live/Animate button will switch to animation mode, and will select the forecast time near to the current live time when possible.

Figure: 16–16  Example with activated animation mode, selected forecast date/time 2011–12–06 22:00, activated loop and play buttons, actual value read outs corresponding to mouse–over location

**NOTE**
The read outs will always be available within the geographic area of the selected GRIB files – values are interpolated to the nearest available raw grid location. Read outs will be available independent of currently selected and configured layouts.

**NOTE**
The Live/Animate button may be deactivated due to characteristics of the currently enabled GRIB files. Non overlapping geographic regions or non overlapping time ranges will deactivate the Live/Animate button. In this situation some files must be disabled to have the animation mode available – i.e. press the Inst button and change the GRIB files configuration.
In animation mode the following actions are available:

- **List selection**  select the requested forecast time
- **<<**  select the previous day
- **<**  select the previous time list entry
- **Play**  start at the current time list entry and advance to the next entry every single second
- **>**  select the next time list entry
- **>>**  select the next day
- **Loop**  loop through all time list entries (in play mode only)
16.5 Context Menu

A context menu is shown, when right clicking inside an active weather geographic area.

Figure: 16–17 Example showing a context menu with shortcuts for Weather–Report, Weather–Info, Weather–Legend and Char–Information

The following actions are available:

- **Weather Report** builds an hourly weather forecast for the selected geographic location. Time range starts with the current live time and ends with the last available forecast time.
- **Weather Info** opens / closes the weather info dialog
- **Weather Legend** opens the weather legend view
- **Chart Information** open the chart information view (see ECIDS Basic User Guide)
- **Cancel** close the context menu

16.5.1 Weather - Report

A weather report shows all available products for the selected geographic location. Time entries are created for every single hour up to the end of available forecasts.
**Figure: 16-18** Example showing a weather report starting on 2012-01-17 14:00

**NOTE**

Values which do not exist for the specific forecast time are interpolated over time and marked with an asterisk (*) after the product name.
16.6 Legend

The legend shows example symbols with attached limits and isoline examples. Symbols and numeric values will be shown in orange colour when exceeding the respective limit.

Figure: 16–19 Example legend with wind symbols, wave symbols, current symbols, isoline symbols (mean-sea-level-pressure, air temperature, and wave height), cloud cover symbol and WetterWelt example symbols. An attached numeric value to a wind symbol stands for a gust (kn) value, an attached numeric value to a Wave symbol stands for a wave-period (s) value.
Select chart type (only S-57 or ARCS)

Menu Item (Option) changes to

S-57 93/3 Chart selected

ARCS Chart selected

Chart loading
**S57 Installation**

1. Import unencrypted
2. Import IHO S53
3. Install Database
4. Valid CD not found
5. Install (cont.)

**Installation Database**

- Insert a CD containing the database.
- Select the database to install.
- Install the database.
- Check the installation.

**Importing IHO S53**

1. Select the IHO S53 file.
2. Import the IHO S53 file.
3. Check the import.
4. Confirm the import.
5. Complete the installation.

**Importing unencrypted**

1. Select the unencrypted file.
2. Import the unencrypted file.
3. Check the import.
4. Confirm the import.
5. Complete the installation.
5 ARCS Installation

For installation or update, place an ARCS Chart CD or Update CD into the drive and press Install Volume.

Volumes
- GB RCI: Charts 2004-09-23
- GB RC2: Charts 2004-10-04
- GB RC3: Charts 2004-09-27
- GB RC4: Charts 2004-04-04
- GB RC8: Charts 2003-07-03
- GB RC9: Charts 2003-10-07
- GB VX44 B4: Update 2004-10-28

Information
- United Kingdom
- RC11 [HCRF: A Version 07.00]
- Issue Date: 2003-10-30
- The contents of this file and its associated image and header files are subject to Crown.

View ARCS Zones

Attention
- You did not install the latest edition of the following CD-ROM(s): D:
- The charts may not be up to date. It is recommended to install the latest Chart and Update CDs.
- Do you really want to exit?
Select your chart type

- S57 and CM93/3 Update
- ARCS Update

1. Goto ARSC Chart
   Info / Select...
   S57 + CM93/3 Chart Catalog

2. License
   Installation
   Updates
Chart Update for
- ARCS S-57 C-MAP93/3 C-MAP93/2 IHO S-63

PERIPHERALS connected to COM
1...6
- Autopilot
- Gyro Compass
- Log
- GPS Sensors
- Depth Sensors
- Rudder Position Indicator
- Digitizer

* Uninterrupted Power Supply